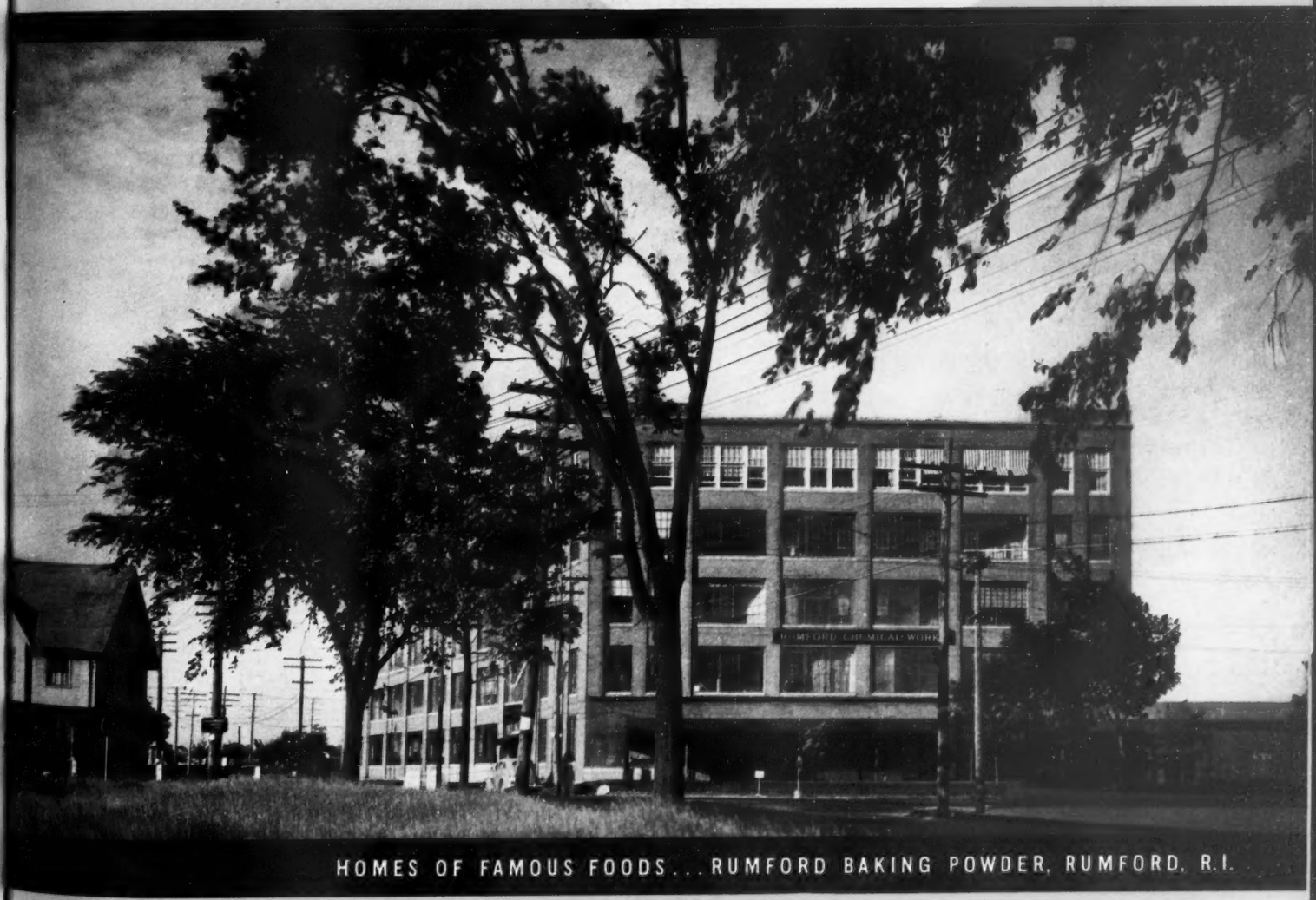
SEP 7 1939

QUALITY STANDARDS FOR CANNED TOMATOES INCLUDING COLOR

FOOD INDUSTRIES

SEPTEMBER 1939



HOMES OF FAMOUS FOODS... RUMFORD BAKING POWDER, RUMFORD, R.I.

IN THIS ISSUE: Quality Control in Food Manufacture, p. 483

Forty Years of Pickle Salting, p. 486

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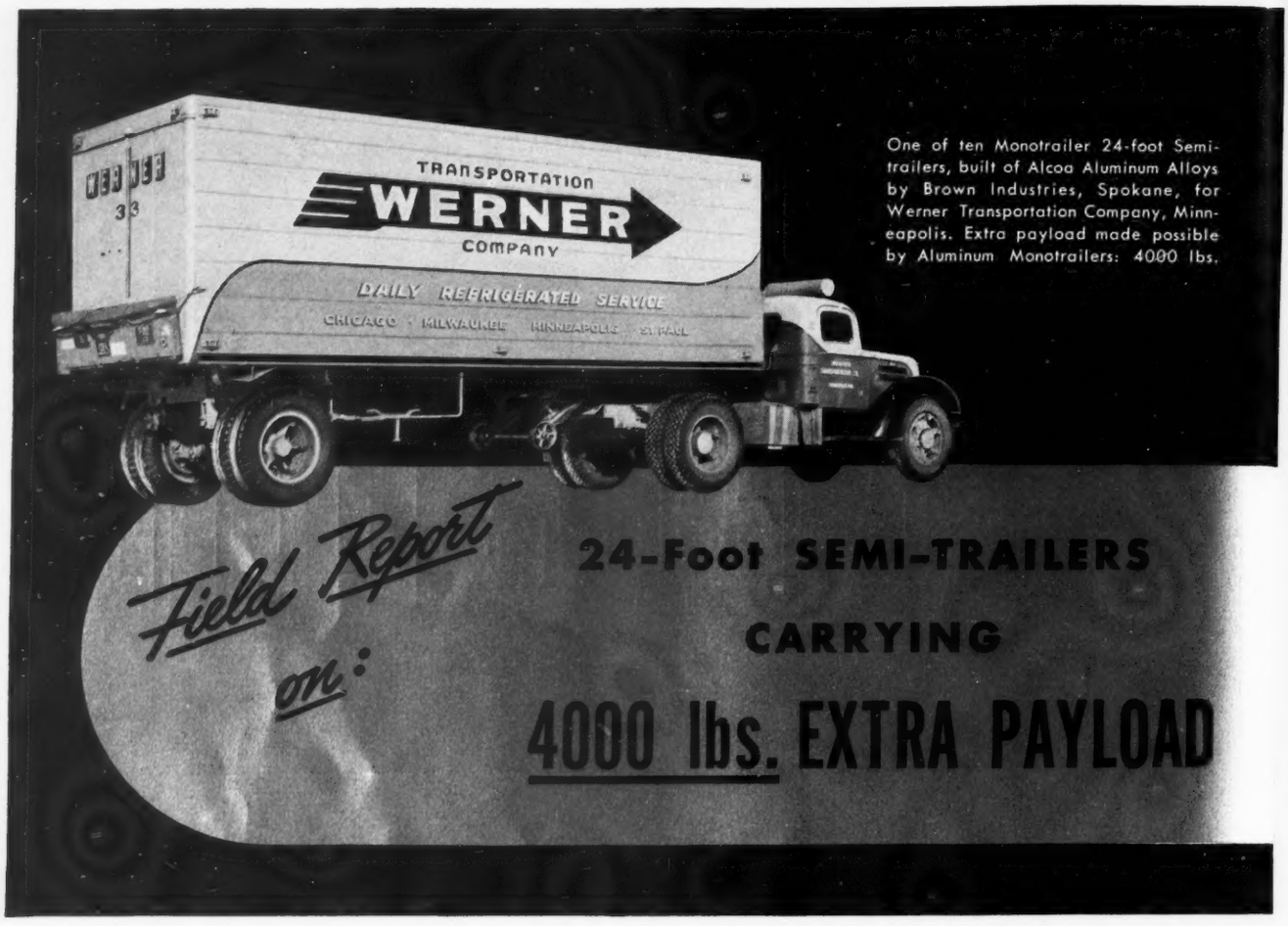
TRANSPORTATION
WERNER
COMPANY
DAILY REFRIGERATED SERVICE
CHICAGO · MILWAUKEE · MINNEAPOLIS · ST. PAUL
One of ten Monotrailer 24-foot Semi-trailers, built of Alcoa Aluminum Alloys by Brown Industries, Spokane, for Werner Transportation Company, Minneapolis. Extra payload made possible by Aluminum Monotrailers: 4000 lbs.
Field Report on:
24-Foot SEMI-TRAILERS
CARRYING
4000 lbs. EXTRA PAYLOAD

Two facts about this semi-trailer unit are important to you:

1 It's constructed of Aluminum Alloys.

2 The type of construction is *monocoque.**

By building with light, strong alloys of Alcoa Aluminum, and by using the superlatively efficient *monocoque* principle included in Brown Monotrailer design, the unit is lightened so a full two tons of extra payload capacity is gained over former requirements. Yet it is extremely strong and safe. This is because Aluminum suits the unusually light and strong monocoque construction. Aluminum sheets and shapes are both light *and* thick, thick enough to be stiff and make a strong, non-buckling, one-piece structure.

The order books show how satisfactory these units are to the operator. Werner Transportation Company bought two units last fall, tried them out. Four more units were bought early this year. An additional four units, bringing the total Aluminum fleet to ten, were recently delivered.

You can get the advantages of Aluminum. Your trucks can carry extra payload at no extra operating cost, and thereby make savings which quickly pay the additional cost of using Aluminum, and then add to your profits. Find out about it. Any up-to-date body builder will explain how he can construct equipment for you from alloys of Alcoa Aluminum which will save by carrying extra payload, by reducing maintenance cost, by being strong and safe for long service.

ALUMINUM COMPANY OF AMERICA, 2152 Gulf Building, Pittsburgh, Pennsylvania.

* *MONOCOQUE: Type of construction in which full strength of panels is used to bear load, making chassis unnecessary; this makes a stronger, safer, lighter structure.*

ALCOA ALUMINUM

FOOD INDUSTRIES

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Contents for SEPTEMBER 1939

VOLUME II • NUMBER 9

FOOD TECHNOLOGY

New Discoveries and Inventions

Food Technology
A New Sterilizing Agent 510

Beverages
Apple Juice and Sirups—English Practice ... 510
Beer Made from Wort Cooked Under Pressure 510
Lemonade Powder 510

Canning and Preserving
Preserving Currant Sirup Vitamins in Storage 511
Reclaiming Sardine Cooking Oil 511
Spray Residue Affect Pectin 511
Byproducts Made from Citrus Fruit 511

Confectionery
Chocolate Substitute 511

Dairy Products
Preventing Moldy Butter by Treating Wrappers 511
Preserving Cream by Flash Pasteurizing 511
Carotene Deficiency and Oxidized Milk Flavor 534
Churning Cold Storage Cream 534
Preventing Gassy Limburger Cheese 534

Fish
Codfish Flour in Baking 534
New Kind of Food Poisoning 535

Meat and Poultry
Water Cooling of Poultry 535
Gelatine With Increased Whipping Quality .. 535

Milling and Baking
Putting Vitamin C into Flour 535
High Temperature Conditioning Wheat 536

Raw Produce
Proper Storage Temperatures for Vegetables. 536

Miscellaneous
Spices as Preservatives? 536
Rust Remover 537

★HOMES OF FAMOUS FOODS

On the cover of FOOD INDUSTRIES this month is shown the Rumford, R. I., factory of Rumford Chemical Co., home of Rumford baking powder and founded 80 years ago.

THIS MONTH

Minimum Quality Standard for Canned Tomatoes 497
—Including Color

Laws Forced by Farm Groups Halt Trade in Foods 500
A Public Relations Feature—*By Ivan C. Miller*

Mistakes To Avoid in Packaging—Part VII 495

Formulas for Foods—A New Department 512

PROCESSING

Quality Control in Food Manufacture—Part I 483
By W. L. Campbell
Forty Years of Pickle Salting—Part I 486
By W. G. Wormley
Slide Rule Aids in Standardizing Milk and Cream 489
By B. I. Masurovsky
Smokehouse Operation Improved by Air Conditioning 490
System Saves Water in Canning Plant 492
By L. M. Jordan
Packaging Plant Good Enough to Copy 493
Give a Man More Than a Number 499
By R. Raymond

DISTRIBUTION

Laws Forced by Farm Groups Halt Trade in Foods 500
By Ivan C. Miller
Hints and Hurdles 504
New Products and Packages 506
New Prefabricated Truck Body 508

EVERY MONTH

Talk of the Industry 479
Automotive Section 508
Food Technology — Abstracts 510
Formulas for Foods 512
The Food Industry News 514
Business Trends 518
Men, Jobs and Companies 520
Catalogs 522
Food Equipment News .. 524
Book Notes 537
Patents 538

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In THIS *Issue*

• MINIMUM TOMATO QUALITY STANDARD

You will find a splotch of reddish color on one page of this issue. It represents the minimum color standard for canned tomatoes under the new Food, Drug and Cosmetic Act. Note that this is a different jurisdiction from the Agricultural Marketing Service. The latter puts out several grades, whereas Food and Drug puts out only one—a *minimum* grade. If you go below it, you are in trouble with your label designations.

Food and Drug has been using the Munsell system of color identification, which means that you must have a special high speed electric motor with a special gadget for spinning the color disks. FOOD INDUSTRIES gives you the same color for the sake of comparison without the use of the whirligig.

Reprints of this insert will cost 50 cents each to subscribers. Otherwise the cost is 75 cents each.

• FORMULAS

Beginning with this issue, FOOD INDUSTRIES presents a monthly Formula Page.

You are invited to write to the editors to criticize or comment on the formulas. If you try them out or find how they can be bettered, you are urged to tell us about it.

For us to claim omniscience about formulas—we hate the word recipes—would be absurd. What you will see published here comes from a wide variety of sources, usually identified sources.

Each formula will be numbered to help you keep track of them. Better start collecting now.

• WHAT QUALITY CONTROL MEANS

By common consent, attendants at the recent Conference on Food Technology at M.I.T. seemed to agree that W. L. Campbell of Kroger's, more than any other person on the American scene today, understands what Quality Control really means.

Where he says that the general procedure for improved quality control involves adopting continuous processes wherever possible, he finds FOOD INDUSTRIES ready to shout "Amen." See his article on page 483 of this issue of FOOD INDUSTRIES.

• EXPERIENCE TELLS

W. G. Wormley, who tells about his forty years of experience in pickling, was with H. J. Heinz Co. for his first twenty years of business. Then later with Libby, McNeill & Libby, Standard Brands, and other concerns. When he wrote the series, which begins on page 486, he was living in Santa Barbara, Calif., a location that hints of one who is beginning to take life a little easier.

As far as we can learn, this is the first time anyone ever wrote full instructions about how to salt, cure and finish pickles and related products.

In FORTHCOMING *Issues*

• FARMER RELATIONS

"Our most acute problem of public relations," writes one food manufacturer," is not in the field of labor relations, but in the field of farmer relations. All of us who deal with farmers would appreciate your help, if you can find anyone who has been successful here, and tell us how they did it,"

That sort of letter always stimulates us. When readers tell us what they want to read and why, the editors do not have to rely entirely on their own judgment. The foregoing request will be answered either in October or November. It is one of the most constructive jobs we have ever seen done by a food manufacturer.

• CONTINUED STORIES

"Good things come in small packages" may be a true saying in certain lines of endeavor, but often it does not apply to the articles published in FOOD INDUSTRIES. And when these articles are too long for convenient reading and study in any one issue, then we split them up into two or more parts and publish the parts in succeeding issues, just as popular story magazines do. This serves two purposes: It permits the publication of worthwhile articles that are too long to print at one time. And it gives the reader something very definite to look forward to in the next number.

Two good examples of this will be found in FOOD INDUSTRIES for September and October. The October number will carry the concluding part of W. L. Campbell's paper on "Quality Control in Food Manufacture," the best on the subject that we remember ever seeing. In this second part, the author will tell how quality control works out from the economic standpoint. No reader can afford to miss the author's conclusion on this subject.

October FOOD INDUSTRIES will also contain the second of the three parts into which the article "Forty Years of Pickle Salting," by W. G. Wormley, has been divided. The complete article is one of a series in which the author lays bare the secrets of the economical manufacture of good pickles, as determined by a lifetime of successful operation of pickling plants. In the October installment, the author's best salting formula and procedure will be discussed.

• REMINDER

Just in case you overlooked the announcement in July, we want to call your attention again to the 16-page feature of FOOD INDUSTRIES for October, "Flow and Liquid Level Control."

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LAURENCE V. BURTON, Editor
Volume 11, Number 9 September 1939

The Talk of the Industry

» No more convincing evidence of the devastating character of Washington's summer heat need be produced than John L. Lewis's recent outburst anent an "evil old man."

» Anyone who has ever tried to recover on a perfectly legitimate and valid claim against a Japanese firm, and has experienced the run-around which the Japanese are so adept at administering, is highly amused at their reaction to the U. S. denunciation of the commercial treaty of 1911.

» Speaking of the problems of making glandular materials from animals into pharmaceutical preparations, a European concern has been having its troubles with the production of female sex hormones. No men may be employed in this work because they soon develop feminine characteristics, noticeably enlarged breasts and hips. Which makes them the butt of ridicule and ultimately causes costly damage claims.

On the other hand, it is almost impossible to keep women working in the department for any length of time because they soon become more beautiful, win husbands and quit work. Absorption of the hormone through the skin of the hands seems to account for the phenomena. The noticeable beautification of women does not involve alteration of bone structures. But it does involve the clearing up of discolored skins, the filling out of undeveloped figures and the conversion of a scrawny female scarecrow into such a comely and shapely creature that a mere man must needs have her for his very own.

It would appear that concerns in that business ought to be able to charge real money for the privilege of working there.

» Advice to job-seekers. If the experience of Food Industries parallels that of other concerns, a lot of men are being unfair to themselves and to those who might assist them. Our files contain a huge number of letters and personal histories of men who have asked us to suggest their names whenever an opportunity for a job shows up. Some of these letters are from one to three years old. Some, we find, have long ago obtained jobs but have failed to notify us.

A proper procedure for a man on a job hunt is to notify those with whom he has corresponded whenever his needs for employment are filled. It both gratifies the recipient to know that somebody's problem is solved, and lets him know where you are.

» According to the latest change in the Social Security Law the tax saving to manufacturers will amount to about $825,000,000 in the next three years, for the tax rate remains at its present level. It also means that the New Deal cannot longer count on the anticipated tax increase as government income.

» A friend recently condemned high pressure salesmanship. Which started an inquiry into the definition of high pressure selling.

Our own view is that when a prospect has to answer to a cold-blooded board of directors for reasons behind all his purchases, there is no such thing as high pressuring him into a deal. The only time when the high pressure artist rates that term occurs when the prospect has no one to answer to but a wife who is still sold on her husband's perfection.

» In all the coming political furore, with a bunch of well meaning amateurs proposing further meddling with matters economic, it is well to keep in mind that failure to take legislative action does not repeal or even obliterate the natural laws of human behavior, also known as economic laws.

» Congress has adjourned, which

ordinarily would be good news. But when it failed to correct the iniquities of the Wagner Law, most folks believe Congress should be compelled to sizzle in Washington's heat, or some place much hotter, until the law is made fair and reasonable.

Opportunity

IN VIEW of impending developments in the use of inert gases in packaging of foods there is a potential need for cheap nitrogen. Of course, you will say that various manufacturers of compressed gases now sell nitrogen very cheaply. Which is true. But the present day sources of nitrogen contain too much oxygen to meet the potential demand.

What is needed is nitrogen that is practically free from oxygen, at a net cost to the user of around 2 or 3 cents per lb.

Carbon dioxide is cheap and pure, and is readily available, but it possesses certain characteristics such as solubility or diffusibility that limits its use. Nitrogen would be more effective in many places.

Public Ownership Has Its Sorrows

DOWN IN TENNESSEE some of the trials of public ownership of utilities are now becoming apparent. After TVA took over the Tennessee Electric Power Co. for $78,000,000, the community now becomes aware for the first time that it is likely to lose taxes formerly paid by T.E.P. to the tune of $2,200,000 per year. And a big row is now developing as to who is going to pay the money now.

All of which is in line with the oft repeated saying that many a county government would go unpaid were it not for the taxes paid by bankrupt railroads. If the government owned the railroads, it is difficult to see where the counties would get their present revenues.

Advice to a Young Man

MILITARY LIFE is a lot different from what you might imagine. Mostly it is like a hard, unpleasant job in a small town where there is nothing to do in off hours or Sundays. It is drudgery, hard work, long hours, long waits, and boredom except for occasional lively moments.

If you know how to handle men and are a leader, you'll become a non-com. in short order, or maybe an officer. If you have a profession or a skilled trade, you'll find plenty of places for your talents. You may be able to escape some of the drudgery. A pipe fitter, carpenter, blacksmith, auto mechanic, truck driver, tinsmith, machinist, welder, electrician, locomotive engineer and the like are just as much needed in an army as in civil life. The same goes for cooks, accountants, stenographers, typists, and clerks. Also for doctors, dentists, veterinarians, chemists, bacteriologists, photographers—even artists. And, of course, all sorts of engineers, especially civil, refrigeration and sanitary engineers, are in great demand. Those whose occupations are regarded as professions are usually made officers.

But all that is, one hopes, far in the future. What of today? What should a young man do to prepare himself? Here are a few things to consider:

Are you strong and fit physically? Can you walk 10 miles easily? Can you dig a ditch for one hour without developing great muscular lameness? No? Better start out now to get strong. It's much easier to start gradually now than later intensively under a tough drill sergeant.

Can you get along peaceably with all types and classes of men? Bootblacks, roustabouts, day laborers, farmers, office men, professional men, race horse touts, loafers, no-good-guys, even thugs? No? Better learn how, or else be so good with your fists that nobody will bother you.

Can you take orders from men you

Hors d'Oeuvres

• *A food market in Varnville, S. C., took fire one night recently. But heat from the flames caused bottles of carbonated beverages to expand, blow their caps, spew over the flames and quench the fire like a World's Fair thirst. But then, it's nothing home brew wouldn't have done.*

• Amidst the wide expanse of its back yard wheat field at the New York World's Fair, Continental Baking Co. crowned pretty blue-eyed Eileen Stopher of Mt. Pulaski, Ill., "wheatheart" of the Fair. Nothing corny about Eileen.

• *Charles Gray walked into a grocery in Pensacola, Fla., in September, 1936, to purchase cigarettes. Want to buy the store, the grocer asked. "I haven't any money." "You don't need any. Take the store and pay me $10 a month." Gray took it. The owner walked out and hasn't been heard from since. So if you aren't making a profit and no longer get a kick out of cussing the New Deal, there's an idea for you.*

• At a Swift party at the World's Fair we were served an American buffet luncheon in quantities that stretched the belt to the last notch. Then word was passed around that dishes prepared by twenty of the leading culinary artists of the world, chefs from the foreign pavilions at the Fair, would be carved. And there we sat, crammed full of American ham. But it was darn good ham.

• *The World's Fair finally has opened its food exhibit. Among an array of mechanized surrealistic dioramas is a little panel explaining how food manufacturers have freed the modern housewife. Illustrations of packaged foods surround a toy Mrs. 1939 which wiggles about the midsection like a show girl on Forty-second Street. The display shows the things for which Mrs. 1939 has time: bridge, books, golf, tennis, bathing, theaters, divorce and, of course, wiggling.*

• The Pilgrims on the Mayflower intended to settle in the mild climate of Virginia. But when the little storm-delayed ship finally arrived off Cape Cod, the party decided to land at once. The Pilgrim fathers wrote in their journal, according to United Brewers Industrial Foundation, "We could not now take time for further search or considerations, our victuals being much spent, especially our beer." So for lack of beer we give you Plymouth Rock.

• *Having been ordered by FTC to cease using the label "Old Virginia" on ham packed outside that state, United Corp., Chicago and Cambridge, Md., has decided to move into Virginia. But what's a company to do that peddles "Luna Prunes" or "Mars Marmalade"?*

• Americans annually eat two billion Norwegian sardines. Tail to tail, these would encircle the earth more than five times. That's one fish story even your arms are not long enough to tell.

• *Polish people in Pennsylvania were said not to be buying grapefruit because they had no name for it. So the Florida Citrus Commission consulted the Library of Congress, which unsuccessfully consulted a Polish dictionary. Finally the Polish Embassy was asked for the name that applies to the big citrus apple in Poland. What you think? It's "grapefruit."*

F.K.L.

may consider your social inferiors without resentment, without complaint? Can you do mean, dirty, rotten kinds of work without humiliation or developing a psychosis as a result? Can you do more than your share of work on a group job without getting sore. Can you take it?

Can you get up promptly when called, and go to bed at someone's else direction without resentment?

If your answers are "yes" to these questions, you will find initiation into military or naval life a much easier experience than if your answers are "no."

Your ability to do all of those things is highly desirable in all walks of life. But in the military service it is indispensable.

Don't wait until you are required to comply. Prepare now. The way will be much easier later. In fact it is a very good preparation for civil life.

Digest of State Food Regulations

THE WORK of preparing the editorial section of the 1939–40 edition of the FOOD INDUSTRIES CATALOGS AND DIRECTORY is nearing completion. For the past year, Miss Phyllis Carlberg of the editorial staff of FOOD INDUSTRIES has devoted all her time to revising the digest of state food laws and regulations which we publish there in tabular form. From the tables one can see at a glance all the requirements of any state on almost any given aspect of state or federal food regulation.

Because of the very considerable enlargement of the scope of this work, it is necessary to omit from the current volume the list of trade associations and scientific societies, as well as the list of state enforcement officers. Also the federal food law. These were, however, published in the 1938–39 edition, and you are urged to keep the old edition on hand for reference purposes.

A new group of flow diagrams will appear, also the federal food regulations up to August.

Elementary Public Relations Matters

WHAT SORT of a reception does the business caller receive at your office? Does he feel that he is acceptable as a decent human being, or does your set-up make him feel that he is about to enter a most inhospitable place, or that you are wholly indifferent to him and his comfort and state of mind? All this is quite apart from whether or not you may wish to do business with him.

Not long ago we visited a plant where callers were apparently regarded as poison ivy or smallpox. The man we wanted to see was out. Yes, they thought he would be back sometime. Yes, we could wait if we wanted to. After one hour we discovered that he might be at any one of several branch plants in the same town. After two hours we suggested that the receptionist-telephone operator could phone around and see if Mr. . . . cared to see us.

What! Call him up to tell him a caller was there!!

Why not? If he wants to see us we'll wait. If not, we'll move on.

Most unusual. Never had been done before.

At which we lost our temper and suggested, none too gently, that the telephone operator was being addressed by one of the owners of the business.

Boy! Did that bring results! Even the sales manager came out to placate the caller. The man whom we asked for really wanted to see us and was back in five minutes. Said he would have come long ago had he known we were there.

In our opinion, any caller on legitimate business has a right to learn if an individual cares to talk to him, just as much as if the caller were a stockholder. The girl, a small town product, could hardly be blamed if she had not been instructed in how to handle strangers. The fault lay entirely with the management which was supremely indifferent to all public relations.

For Better Flavors

WHILE INDUSTRIAL FOOD PRODUCTION may be truly called industrial kitchendom, it is seldom that food companies number on their staffs men who can be properly termed finished chefs—men who are top notch cooks in the accepted consumer sense—men like Michel P. Vucassovich, food technologist of Gorton Pew Fisheries Co., who can design a plant, develop a new product or method of processing, design the equipment, operate a plant or go into the kitchen of his own home and whack up a meal that is a culinary triumph.

A few such artists are found here and there in the food industry—but only a few. From such a one has come a complaint about the lack of skill and finished workmanship that should exist in any manufactured food to set it apart from the products of other manufacturers. And it is fairly common knowledge that consumers willingly pay extra for this flavor appeal when they can find it.

To illustrate the cause of his complaint he takes us on a mental journey through a manufacturing department of a small or medium size manufacturer where nobody but the foreman knows the formula of the products made there—not even the owners of the business. He alone decides how it is to be made, and he alone buys all the ingredients. Yet he seldom has any contact with the consuming public and is apt to be temperamental to the point of resisting any suggestions as to improvement or need of improvment. He got there by seniority or by virtue of the fact that he once had a similar job in another establishment whose products sold pretty well and probably brought his formulas with him.

Now, says our master chef, you begin to see why so many industrially produced foods of the same type taste alike, look alike—are alike. They contain no imagination, no zest, no creative skill. This, he avers, is the crying need of the food manufacturer of today—a need to create a definite individuality of flavor that will attract and hold a large mass of consumers because nobody else has it.

With his feelings, one can but concur, yet recognizing the fact that the industrial culinary triumph must be one that is capable of production by mass production methods. Improvement of flavor offers a splendid opportunity, but it is also a hazard, for it requires much patient experimenting and testing of public reaction. But it is a job that should be carried on continuously. It is never done.

Is This the End of Progress?

UNDER the new Food, Drug and Cosmetic Law, "reasonable" definitions and standards of identity are now beginning to appear. But some food manufacturers are expressing considerable doubt as to their reasonableness. And nearly all food technologists who have given any thought to the matter are apprehensive of the probable effect of these "reasonable" standards on future developments in food technology. For it is apparent to all that these standards are bound to have the effect of "freezing" technical progress at its present state, and make it very difficult to introduce technical improvements.

The standard for evaporated milk limits the optional use of stabilizing salts to disodium phosphate, sodium citrate and calcium chloride, and by implication prohibits the use of bicarbonate of soda. Though we do not shed a crocodile tear over the sodium

bicarbonate restriction, we are not at all convinced that the ultimate in milk chemistry has yet been achieved. And if, perchance, some one should patent a new and better method of evaporated milk stabilization, it will be "reasonably" easy for the rest of the industry to prevent the successful inventor from utilizing his invention by preventing a change in the present definition and standard of identity.

Tomato Juice Standard

In the regulation prescribing a standard of identity for tomato juice a similar problem exists, except that here it is retroactive and prohibits the use of a patented method because "heat may be applied by any method which does not add water thereto"—even if the equivalent amount of water is subsequently evaporated. This quoted statement precludes the use of live steam for the purpose of destroying pectin methyoxylase, the remarkably rapid pectin destroying enzyme of the tomato.

If the patentee should discover another method of restraining the enzyme until the juice could be boiled, the method would have to conform to the definition as now promulgated, or the rest of the industry could successfully oppose a new definition that would permit its use.

Proponents of the new standard aver:

1. That the water would be different water than that which came from the original tomatoes, to which one can only say true, but unimportant. *De minimis non curat lex,* meaning the law does not concern itself with trifles—is an old and well established principle of jurisprudence.

2. That some flavor has been lost by evaporation, to which one must also say true and likewise unimportant. If it were important, then all evaporation should be prohibited if any volatile substances escaped. This would affect tomato catsup, pulp, chili sauce, Spanish sauce, paste, and soup. Also all fruit concentrates, and many dehydrated products.

Unless more care and liberality is utilized by the government in drawing up these standards, then technical progress is likely to be seriously impeded. Which will probably result in an amendment to the Food, Drug and Cosmetic Act.

Labeling Status of Dextrose and Sucrose as Ingredients

On July 25, 1939, Secretary Wallace issued a departmental ruling that is a very important decision in the battle between the sugars. To some it sounds like an armistice, to others it sounds like a victory for the dextrose manufacturers, while the Information Service of the U. S. Department of Agriculture interprets it to mean a perpetuation of the Hyde ruling of Dec. 26, 1930, which expired with the old Food and Drug Law.

The Wallace Ruling

The significant part of the Wallace ruling is very interesting. He says:

"The (Hyde) ruling cannot be reissued in its entirety under the new Federal Food, Drug and Cosmetic Act. One reason for this is a new provision requiring label disclosure of all ingredients, including sugar and dextrose (refined corn sugar), in foods for which no definitions and standards of identity have been prescribed. Another reason is that, in prescribing a definition and standard of identity for any food under the new law, the Secretary of Agriculture must base his findings upon substantial evidence of record introduced at a public hearing on such definition and standard. The recognition given dextrose in each individual standard, therefore, and *the question of label declaration of sugar and dextrose used as optional ingredients depend wholly upon the character and sufficiency of the evidence.* (The italics are ours.)

"It is the purpose of the Department in the formulation of definitions and standards for food to recognize, *where the evidence of record justifies,* the optional use of sugar and dextrose (refined corn sugar) without label declaration of either." (Again the italics are ours.)

From the ruling we see only a victory for common sense—not a victory for dextrose. We also see common sense prevailing over some of the less realistic, even over-zealous, ideas originating in the ranks of the Food and Drug Administration. Sucrose refiners have lost millions of pounds of annual consumption to dextrose since 1930, and cannot be blamed for attempting to retrieve lost markets. On the other hand, dextrose has definite properties that differ from sucrose and these merit its use where such properties add to the value of the food in which it is used. And its proper use should not require a label declaration that apparently implies a reprehensible act.

An unfortunate feature of the ruling is one which is required by the law itself. It becomes necessary to go through the same lengthy testimony regarding the use of dextrose and sucrose at every hearing on every food that comes up for a hearing on the definition and standard of identity if manufacturers expect to continue to use dextrose without a label declaration.

This means that food manufacturers themselves must introduce factual evidence (not unsupported opinions) as well as the dextrose and sucrose manufacturers. Always remember that if the evidence is not in the public record, under the terms of the law, the Secretary cannot utilize it even though he may know all about it.

Psychological Factors Affecting Meat Flavor

A friend reports that the next big improvement in meat quality, especially from the viewpoint of flavor, will arise from substitution of electrocution of animals for the existing methods of slaughter. Many European plants employ electrocution today and in that respect the U.S. appears to be trailing the procession.

Discovery of the economic value of electrocution in the U.S. came about after a research into the reasons why glandular material from abbatoirs contained much smaller amounts of active principle than is known to be normal for a healthy animal. Investigation disclosed that the fright, which the animal experienced in its last moments, caused many of its glands to empty themselves into the blood stream. When electrocution was substituted the psychological stimuli were either absent or so curtailed that the glands did not discharge. And thus the manufacturer of biological preparations had a more potent raw material with which to work. Also the packer had a carcass that bled more effectively.

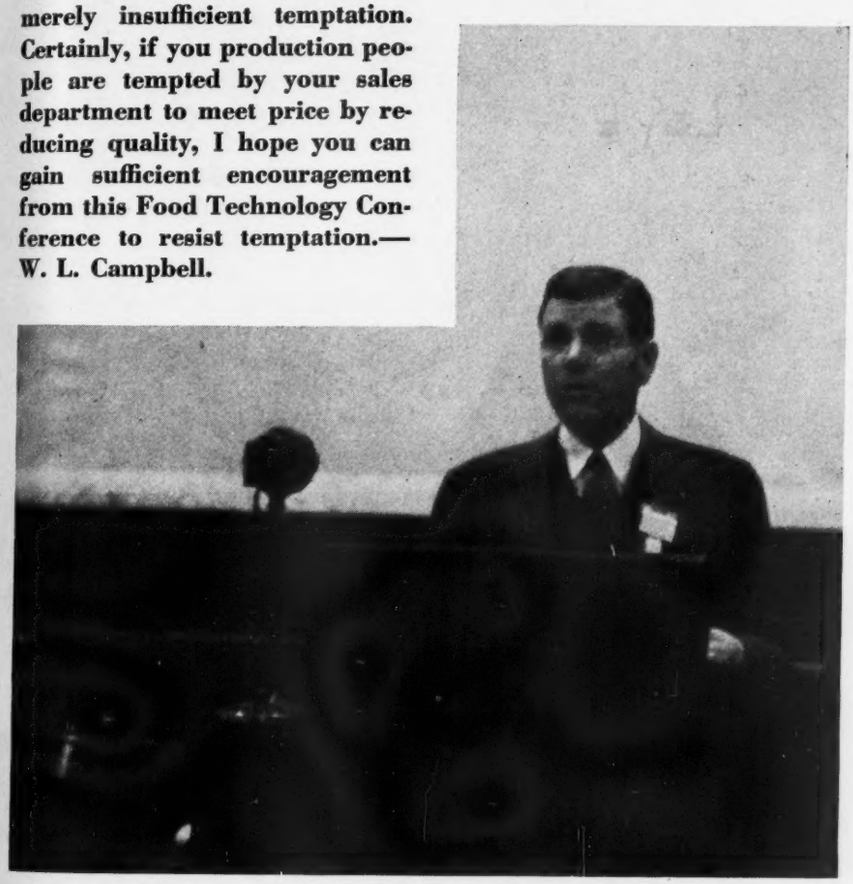
As an important byproduct of this investigation it was discovered that the flavor of the meat was noticeably improved by the changed method of slaughter. Which suggests that adrenalin, etc., must have an unpleasant flavor.

To say, however, that the electrical method will be instantly accepted, is, however, to overlook the very important fact that electrocution is a much higher cost method. Its greater expense is not due to the cost of electric power consumed, but to the fact that it is a much slower method than is in use today. Hence, if the improved quality is to be obtained without a parallel increase in production costs, a great deal of research must be done by food technologists on how to mechanize and speed up the operation.

QUALITY CONTROL in Food Manufacturing

By W. L. CAMPBELL *
General Manager of Manufacturing, Kroger Grocery and Baking Co., Cincinnati, Ohio

George Bernard Shaw advances the theory that virtue is merely insufficient temptation. Certainly, if you production people are tempted by your sales department to meet price by reducing quality, I hope you can gain sufficient encouragement from this Food Technology Conference to resist temptation.—W. L. Campbell.



"After all, Gatti-Casazza, the great impresario of the Metropolitan Opera House, said that the real test is the box office."

PART I

WHEN Dean Prescott's invitation to take part in the Conference on Food Technology reached me, I felt compelled to accept for two reasons: First, I believe that quality control in food manufacturing is the very cornerstone of the industry. A bad product not only reflects on the actual manufacturer, but often also on the entire industry. You heard at the previous Food Technology Conference how the high-temperature pasteurization of milk received a set-back for many years because of poor control by some of the users, and many other instances might be cited in the food industry where lack of this control is a reflection on all of us. If one baker turns out a poor loaf of bread, then many people criticize bakers' bread generally. We have seen fit to spend a lot of money to secure our present control and, generally speaking, our plants are open to visitors at any time. And if, because of some of the things that we have done, we are able to promote quality control more effectively, we are glad to place these facts where they may be available to others in the same line of work. Second, as Dean Prescott, Dr. Tanner, Dr. Hucker and various other scientists, with the cooperation of such firms as Frosted Foods, Dewey and Almy, Gorton-Pew Fisheries and others, have carried the load of promoting these conferences and making them an outstanding success in which all of us have profited, it is incumbent on all the rest of us to help in carrying on the good work in furthering their efforts in promoting modern methods of food preparation.

President Eliot of Harvard once said, "He who knows not the value of good food is to that extent uncivilized." Having served an apprenticeship in the railroad business and having been exposed to food under a wide variety of circumstances, I can personally vouch for the large number of barbarians engaged in dispensing our daily bread, judged by President Eliot's standards. However, just when life seems blackest in this respect we come upon a ray of hope in food that is fit for any king, whether it be in such world-renowned restaurants as Antoine's in New Orleans or just a home lunch at some unknown way station. We all know the difference is quality control.

Tomorrow evening we shall hear the "Pop" Concert in Symphony Hall. Competent critics rate the Boston Symphony Orchestra as the peer of any symphony orchestra in the world. The instruments are not any better than can be purchased for any other orchestra, the music is the same as has been played by others many times before and yet, if you are fortunate enough to hear that orchestra in one of the great classics, you'll really appreciate what quality control means.

A musician may pay $50,000 for a Stradivarius violin and $1,500 for a Tourte bow, but unless he also has a 10 cent piece of rosin, even Fritz

* This was the keynote address at the Second Conference on Food Technology, Massachusetts Institute of Technology, Cambridge, Mass., June 28 to July 1, 1939.

Kreisler couldn't produce music. The same analogy holds good in the food manufacturing business. Anyone can purchase machinery and raw materials, but the one distinguishing feature between success and failure is how you handle your organization—and that means quality control.

Half-way measures are no good. I once called on the general manager of the Singer Sewing Machine Co. to sell him some machinery and said that what I offered was pretty nearly what he wanted. In fact it was the nearest regular machine to suit his needs without building something special. His reply has been indelibly impressed on my mind. He said that, when he had started in life to learn the machinist's trade, his father had told him, "It's a damn sight further from 'pretty near' to 'just right' than it is from pig-iron to 'pretty near'."

Dostoevski wrote that suffering is the one and only source of knowledge. Most manufacturers will agree with that statement. However, in your pursuit of knowledge on quality control you will also gain efficiency control and open up new angles of your business that you never knew existed.

No more striking example of the change in emphasis in industrial promotion is needed than that of the Ford Motor Co. The old Model T was strictly a price item and you were allowed the choice of any color so long as it was black, and by persisting in that policy the company almost went to the wall in the 1920's. Yet today, as America's greatest single industrial plant, look at its emphasis on *quality regardless of price.*

We see the same change in emphasis in many other industrial concerns, and chain stores are not exceptions to the rule. Prior to the World War, chain groceries were generally not thought of at all when quality was mentioned. Today, thanks to quality control, it is a different story, and I only need mention such examples as First National's work on meat and American Stores' on butter.

To give you some idea of this work, I thought I might describe the actual quality control methods we use in three products and, then, our general quality control program as carried on by the Kroger Food Foundation and, finally, we will sum up the results and get down to the economics of the situation as to whether the entire program had been profitable or not. After all, Gatti-Casazza, the great impresario of the Metropolitan Opera House, said that the real test is the box office. We may not be in quite such temperamental business as conducting opera, but the commercial yardstick should, therefore, apply to us even more strongly. Someone has paraphrased the old adage to read "Eternal enterprise is the price of solvency". It will appear, from the facts I will recite, that quality control consists chiefly in taking infinite pains with a lot of detail—and that is essentially what it is. My recital will be in generalities as we need not take the time here to tell whether a particular solution boils at 214 deg. or 218 deg., but rather to show the over-all picture of the importance and profit of quality control.

The three products chosen as rep-

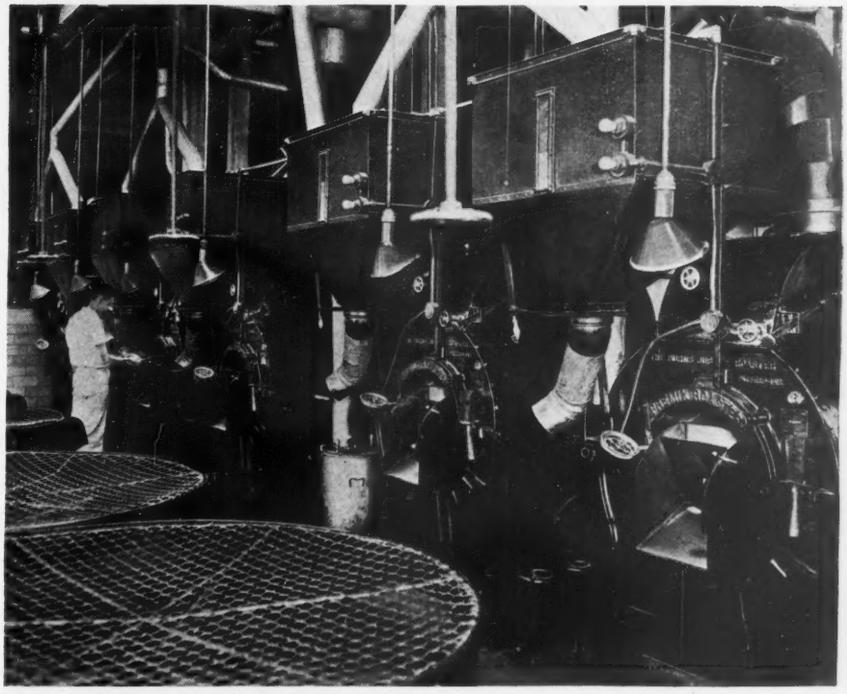
"In the buying of coffee we cup-test five different times to be sure that we get the right material."

". . . coffee in the bean packed in any open type package, whether in tin or paper, first showed evidence of staleness on the 26th day after roasting, while ground coffee under the same conditions began to exhibit staleness on the 9th day from roasting."

resentative of our efforts are coffee, bread and ham.

Steps in Coffee Quality Control

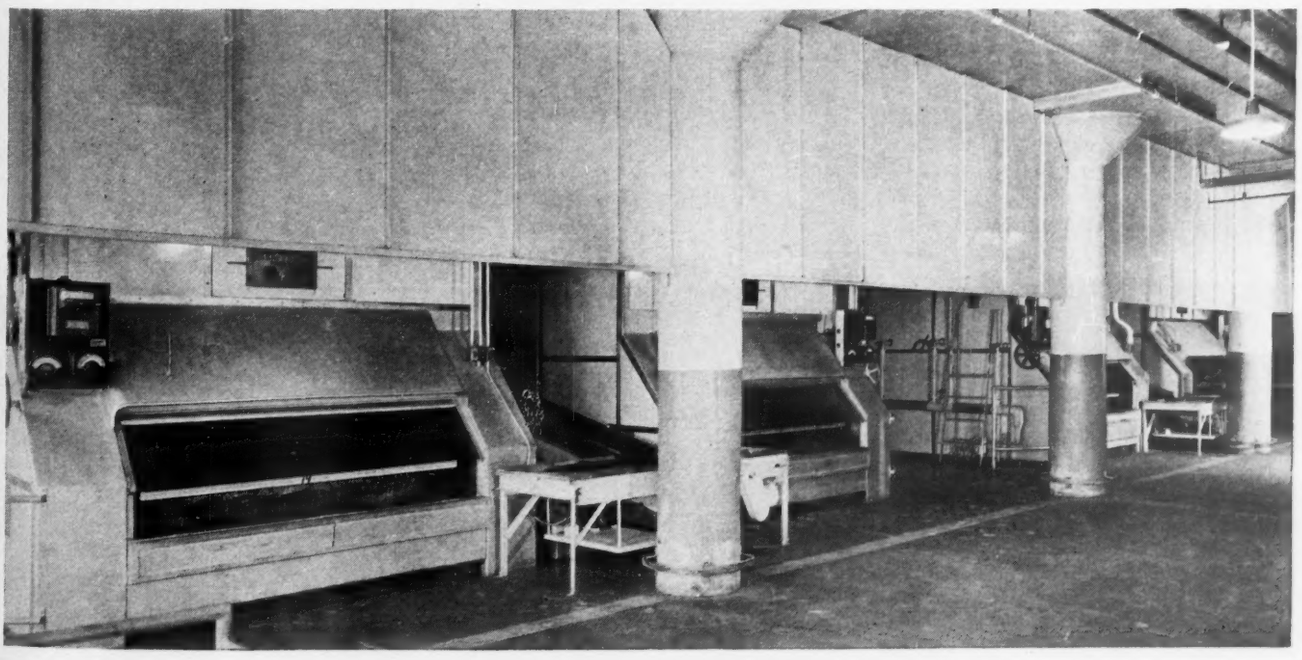
In 1929, at the crest of the boom, we thought we had a very nice coffee business, but at that time the Company employed a coffee expert who had some different ideas from those on which we had previously operated this portion of our manufacturing. He first of all went to the heart of the matter and insisted that we modify our ideas on the purchases of raw material. It was his feeling, to which we all now heartily subscribe, that the coffee, while bought by description and grade, should essentially be purchased for its sweet-drinking qualities rather than for its external appearance or its official designation. Over a period of years, we had been buying certain designated coffees, paying fancy prices in many cases for differences which were not evident in the final cup. An example of this was our predilection for Hard-bean Guatemalas. Secondly, he started a program of revamping our entire roasting equipment so that, given good coffee to start with, we would blend and roast it properly. Then, finally, he started the program of getting the coffee in the stores into the customers' hands in the best possible condition, or in other words, as nearly as possible in the same quality as when it left the roaster. So, in the last ten years this work has progressed until on the buying of coffee we cup-test five different times to be sure we get the right material.



"In addition to giving the roaster a sample of color to be maintained on each batch, we have placed special day-light type electric lights at each roaster, so that the roaster views his samples under the same light—day or night—under all conditions of outside weather."

We cup-test first in the New York office when either stock lots or spot coffees are offered to us. We go to the trouble of specifying how the coffee shall be loaded in the hold of the ship to avoid contamination. After making a selection of the offerings, we cup-test the coffee again after it is purchased by us and arrives in the United States. At this time, blending orders are made up just like a physician's prescription. Upon receipt of the coffee at either

(Turn to page 528)



"All of our bread ovens at the present time are of the continuous type, either the traveling-hearth oven or the traveling-tray oven."

Forty Years of PICKLE

Salting, curing and care of cucumber pickles, onions, cauliflower, dill weed and peppers

By W. G. WORMLEY,
San Jose, Calif.

PART I

(A) Cucumber Pickles

SALTING and curing pickles, like all things in this age of research and investigation, has changed radically in the last few decades. Salting was first done in stone crocks, with quantities of grape leaves distributed in layers through the crock to keep the pickles green after salting. The next development in salting employed emptied whiskey barrels after the char had been scraped out and the barrels thoroughly cleaned.

As the commercial demand for pickles increased, the containers for salting increased in size, and today tanks of various sizes, holding from 400 to 1,600 bu., are used, the dimensions of these tanks being 8, 10, 12, 14, and 16 ft. in diameter, with 8-ft. staves. Thus all have uniform depth, although the diameters are varying.

Tanks may be made of cypress, fir, pine or redwood, with tapered or straight sides, as the buyer desires. Experience indicates, however, that a cypress tank with straight sides is the most efficient and, with proper care, it will last indefinitely.

The cypress tank, while the most expensive, is the best under all conditions, especially if the tank is erected in the open, as cypress does not dry out as quickly as other woods. Fir is much cheaper and will be very efficient under cover, if kept full at all times; but it must never be permitted to stand empty for any length of time, for fir dries out very quickly, soon causing the tank to leak. And thereafter it is very hard to keep tight.

Erection of Tanks

Tanks are erected on foundations made either of 8x8 in., or 6x8 in. timbers, or 4x4 in. lumber. Or, if it is certain that the tanks will remain in the same location indefinitely, concrete can be used, surmounted by the 4x4 in. lumber, making a very satisfactory installation (see Fig. 1).

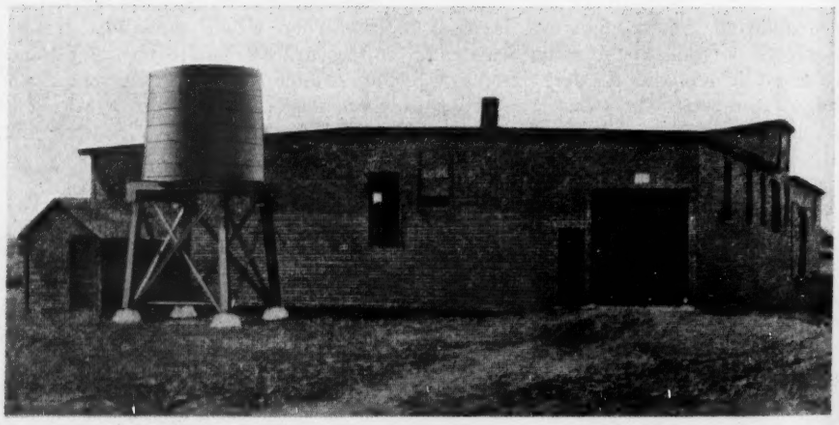


Fig. 2—One of the older type of slating stations with tanks housed in.

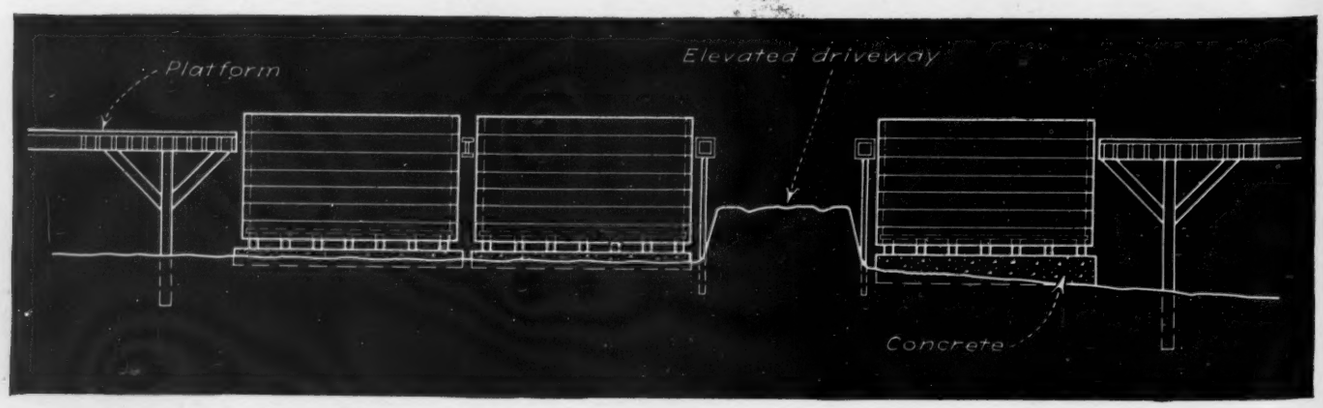


Fig. 1—Where installations are permanent the tanks may be set on concrete slabs.

SALTING

Fig. 4—An open type of salting station. The tanks are apparently old wine tanks. Note the olive cask on the platform.

In the early days of pickling, tanks were erected in two parallel rows with a filled-in driveway between to facilitate unloading farm vehicles. A platform is erected around pickling tanks at a level 21 in. below the top of the tank, as indicated by Fig. 1.

The entire battery of tanks was covered with a roof and sided in, with provision for ventilation at both the bottom and top to insure good air circulation. One of the original type of pickle salting stations is shown in Fig. 2.

Pickle tanks are equipped with false covers that fit inside and are held down by 2x4 in. lumber placed on edge and cleated down. A pump box is provided for each tank and will be described later. This is also shown in Fig. 3.

A good supply of pure water is required for salting pickles, therefore the location of the tanks must be where a dependable supply of such water is obtainable.

As the pickling business expanded, it was found that not all locations were adaptable to the growing of pickling cucumbers, for various reasons. Hence, it is now the custom to erect tanks in the open and provide only a salt bin, office and tool shed. (See Fig. 4). Quite a difference of opinion exists as to which of the foregoing methods (i.e., closed or open type of station) is better, but one is convinced that, taking all things into consideration, the open station is the better. Open tanks, of course, require more salt, for after each rain or snow salt must be added to maintain the strength of the brine. But the cost of the salt thus required is not as much as the cost of the labor and interest on additional investment required for a closed station. Furthermore, the tanks in use in closed stations must be kept in proper condition by skimming regularly, for the shade in inclosed tanks permits the development of a heavy scum that must be removed frequently. In contrast, open tanks exposed to the sun's rays do not develop scum. The ultra-violet rays of the sunlight are the preventive of scum formation. Fig. 5 also shows an open salting station.

Pickle brine is much cleaner and sweeter in an open station than that in tanks erected in a building. In current practice, we now have tanks and also barrels and casks. The smaller containers are for salting small receipts that fail to justify the use of a tank, i.e., for early salting.

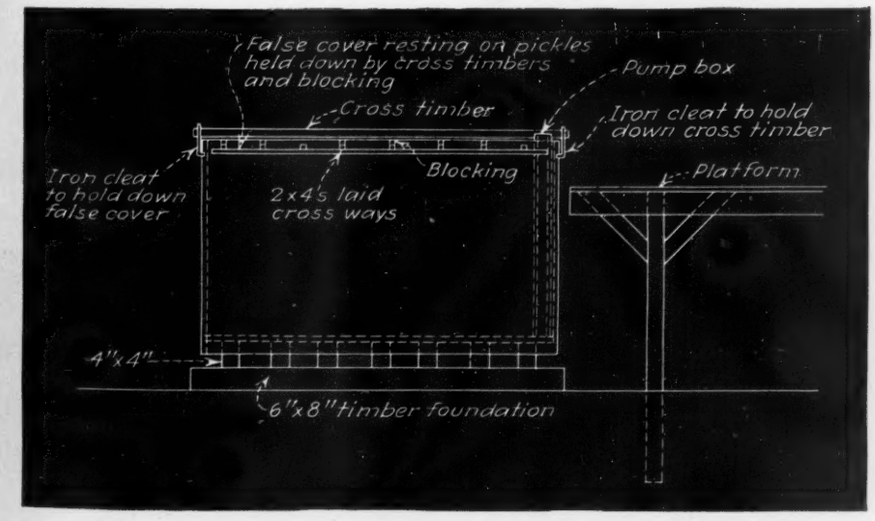

False cover resting on pickles held down by cross timbers and blocking
Pump box
Cross timber
Iron cleat to hold down cross timber
Blocking
Platform
Iron cleat to hold down false cover
2x4's laid cross ways
4"x4"
6"x8" timber foundation

Fig. 3—Cross-section of a pickle tank with pump box, false cover, timbers and cleats or yokes in place.

Sizes of Cucumbers

Most packers receive pickles from the grower in three general sizes: the No. 1, or so-called Vatrun pickles, which are all straight pickles from 1 to 3½ in. in length; the No. 2, which are all straight pickles from 3½ to 5 in. in length; and the No. 3 pickles, which are all the nubs and crooked or misshapen pickles from both the No. 1 and No. 2 sizes.

The increasing difficulty in making contracts with the growers has caused some packers to change their form of grower's contract from three to two sizes, No. 1 being all pickles from 1 to 3 in. in length, both straight and misshapen; and No. 2, all those from 3 to 5 in. in length, both straight and misshapen. This type of grower's contract has proved to be very popular with both the grower and the buyer, as it eliminates the assorting of the crooked pickles from the straight

pickles. The decision as to when a pickle is straight or crooked has always been a cause of much contention. The latter type of contract is preferable under current conditions and its general use is suggested.

It is customary to salt each size of cucumber separately for convenience in handling, but small pickles cure faster than large ones, and the large pickles will cure more quickly and be more uniform in cure and color when all are salted together.

Methods of Salting

There are numerous methods of salting and, therefore, differences of opinion as to which method is best. In the early days we used what was called the dry salting method and now we use the wet method. Some salters prefer salting with low salt content and others with high salt content, but I favor the medium method.

Dry Salting

Dry salting was accomplished as follows: The tank was washed clean. The sides, cover and pump box, being well cleaned, were then sterilized with freshly slaked lime—to be described later in detail. Then a layer of salt ½ in. thick was spread evenly over the bottom of the tank, followed by 15 bu. of pickles, by measure, which were spread over this layer of salt. Then 1 bu., by measure, of salt was scattered evenly over the layer of pickles and then 15 bu. more pickles were placed evenly in the tank and 1 bu. of salt spread over them. This course was continued until the tank was full and well rounded up. It was then left to settle, for as the salt drew the water from the pickles by osmosis, brine was formed. After the pickles had settled sufficiently by shrinkage, the tank cover was then placed on top of the pickles and forced down until the brine rose 3 or 4 in. above it. The cover was then keyed down. The tank was then left to cure.

You will observe that, in this method, the pickles made their own brine and the chances for spoilage were very remote. Nevertheless, while spoilage is nil, dry salting is very objectionable because it shrivels the pickles and entail much handling, and also requires a long "process" in the finishing operations to plump the pickles up and put them in merchantable condition. Furthermore, the flavor of dry salted pickles is much inferior to that obtained by the wet method, so that dry salting is now seldom if ever used.

The foregoing method was used before the salometer was in general use as an instrument for measuring brine density or strength. In those days the salt content of the brine was determined by floating an egg in it. If the egg floated, the brine strength was considered sufficient.

Barrels may also be used for dry salting, but the result is the same.

Low Brine Salting

Pickles may be salted in low brine and a very fine salt stock may be produced by filling good, clean, empty barrels with green cucumbers. When they have been settled by shaking the barrel until no more can be added, the head is placed in the barrel and it is filled through the bung with 40 deg. salometer brine, then bunged up tight and stored on the bilge with the bung up.

If the temperature of storage remains 70 deg. F. or higher, for eight weeks, the pickles will be well cured and possess fine flavor and color. The brine will have a 20. deg. Sal. salt-test and 5 grain, or higher, acidity. But, owing to conditions associated with the rapid fermentation, the keeping qualities of pickles cured in this way are not very good and they must be used within a year. Even then, when processed they do not remain as firm as the pickles cured in the higher brines.

Of the various methods that are used in salting pickles, such as low brine, high brine, dry salting and wet salting, I have taken the best points from all methods. After much research and experimentation, I have evolved the following salting method and have used this method for salting more than 15,000,000 bu. of pickles with 100 per cent success. Therefore, I do not hesitate to state that, if this method is followed closely, there is no reason for spoilage. It must, however, be remembered that every locality requires adaptation in method to suit the local peculiarities.

Water in every locality differs in its various impurities, and this must be considered as it affects the manner of curing. The same is true also of the soil and the method of growing. All must be carefully studied because, for example, pickles grown on irrigated soil require more careful attention because of their quick growth and tender fiber. (Irrigation effects are in a field of controversy, not discussed here.)

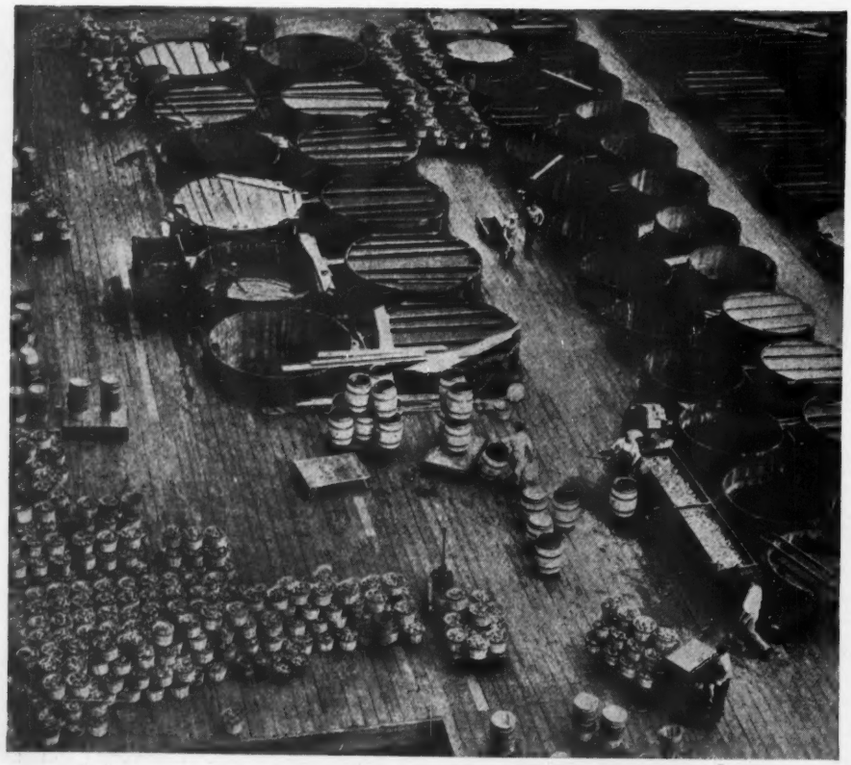


Fig. 5—An unusually large open type of salting station. Some tanks are filled and closed; others empty and ready for filling. The man at the rectangular tank is packing dills.

In Part II of this article, appearing in FOOD INDUSTRIES *for October, 1939, the author will discuss the successful formula for pickle salting which he developed and to which reference was made in Part I, herewith.*

Slide Rule Aids in Standardizing Milk and Cream

By B. I. MASUROVSKY
Consulting Dairy Chemist and Technologist
New York, N. Y.

TRENDS in the milk industry indicate the increasing importance of standardization of milk and cream, for marketing as well as for manufacturing purposes. Methods available for this purpose are involved and require considerable calculation to figure the quantities. For this reason, a simplified method is presented here, with examples illustrating its application.

To avoid confusion, it is recommended that calculations be made on the basis of units of 100 lb. of finished product, and results then converted to the quantities involved in the problem. For instance, 100 lb. of standardized milk testing 4 per cent butterfat is obtained by the use of 97.25 lb. of 3 per cent milk and 2.75 lb. of 40 per cent cream. It is desired to produce 850 lb. (100 gal.) of milk standardized to 4 per cent butterfat. Then by multiplying 97.25 lb. by 8.5 (the number of 100 lb. units in the total to be produced) we find that 826.5 lb. of 3 per cent milk would be needed, and, by multiplying 2.75 lb. by 8.5 we find that the requirement for 40 per cent cream would be 23.375 lb. In this case, the 826.5 lb. of 3 per cent milk would contain 24.795 lb. of butterfat, and the 23.375 lb. of 40 per cent cream would contain 9.4 lb. of butterfat. This would be a total of 34.195 lb. of butterfat in 850 lb. of milk, or 4+ per cent of butterfat.

In the practical standardization of dairy products, it is important to make rules with reservations, since it is one thing to figure out results on paper and another to apply the figures in practice. Errors arise in recording the results of chemical analysis and, also, the specific gravities of milk and cream vary so as to affect the weight per unit of volume. Therefore, a certain tolerance as to both butterfat and milk solids should be allowed in the standardization of dairy products. It is common practice to admit a tolerance of 0.2 per cent in testing dairy products for butterfat. There is no reason why this same allowance should not be made in calculations for standardization of milk products.

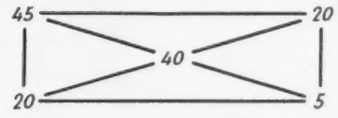
The next step in applying the practical method of standardization is the use of the butterfat factor (B.F.f.), as shown on the slide rule in the accompanying illustration. This is especially useful when either cream or milk is standardized with skim milk. For instance, modify milk testing 4 per cent butterfat with fluid skim milk so that the standardized milk tests 3.5 per cent butterfat. A glance at the slide rule shows that the B.F.f. of 4 per cent milk is 25. Now multiply this factor, 25, by 3.5 (the per cent butterfat desired) and the result is 87.5, indicating the quantity in lb. of 4 per cent milk required in 100 lb. of product containing 3.5 per cent butterfat. The fluid skim milk will then be 12.5 lb., needed to produce the required 100 lb. of milk standardized to 3.5 per cent butterfat.

In case more than 100 lb. of product is required in the above example, multiples of 87.5 and 12.5 respectively, are used in determining the quantities of 4 per cent milk and fluid skim milk required. For example, suppose the quantity desired is 4,250 lb. (500 gal.). This quantity is the same as 42.5x100, therefore the quantity of 4 per cent milk required will be 42.5x87.5 or 3,718.75 lb., and there will be needed 42.5x12.5 or 531.25 lb. of fluid skim milk. In proof, these two quantities add up to 4,250 lb. of product, and the 4 per cent milk will contain 148.75 lb. of butterfat, which is 3.5 per cent of the total quantity of product.

In a similar fashion any problem of standardizing cream with skim milk can be solved.

Whenever a high testing cream is to be standardized with a low testing cream, it is best to establish the multiples per 100 lb. by use of the Pearson's Square method.

For example, using heavy cream testing 45 per cent butterfat and light cream testing 20 per cent butterfat, it is desired to produce a standardized cream testing 40 per cent butterfat.



According to Pearson's Square method it is evident that a mixture of 20 lb. of the heavier cream and 5 lb. of the lighter will give a cream of 40 per cent butterfat. But the quantity obtained will be only 25 lb. In order to get 100 lb. of product it is necessary to obtain a factor by which to multiply, as follows:

$$\frac{100}{20+5}=4$$

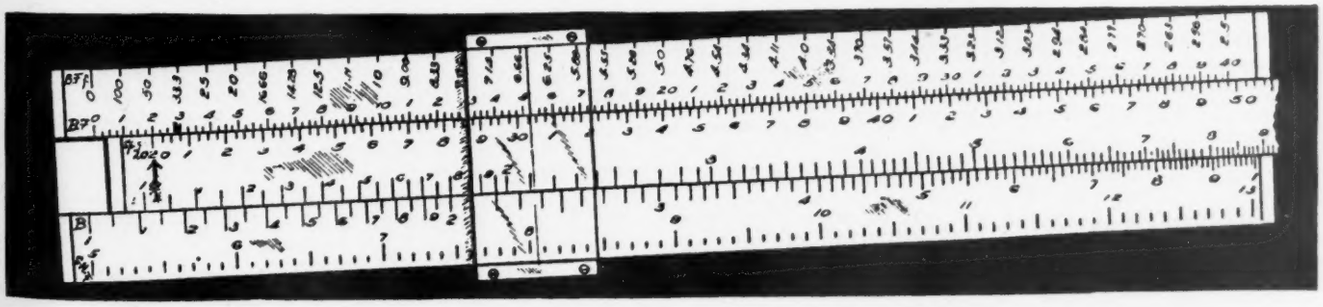
Applying this factor, it is evident that 80 lb. (20x4) of 45 per cent cream should be mixed with 20 lb. (5x4) of 20 per cent cream to obtain 100 lb. of 40 per cent cream.

The same procedure can be applied to other standardization problems, such as standardizing cream with whole milk.

The slide rule shown herewith, which is patented by the author (U.S. patent 1,488,823) is equipped with scales *A* and *B* for carrying out the multiplications involved in the method described above. It also has scales but butterfat content, B.F.f., specific gravity and milk-solids-not-fat.

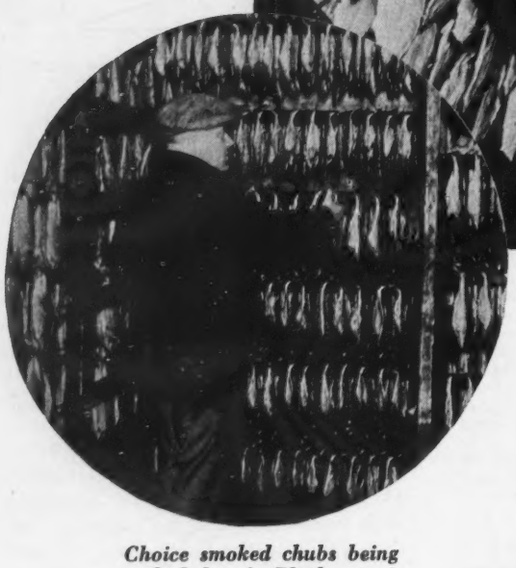
To summarize, observe the following rules in the practical standardization of milk and cream:

1. Always standardize by weight and not by volume, as it is more practical and accurate to do so.
2. Use 100 lb. units as the basis for calculations.
3. Utilize the butterfat factor (B.F.f.) on the Dairymen's Slide Rule when either cream or milk is standardized with fluid skim milk.
4. Employ Pearson's Square method when the milk products used in standardization contain butterfat and no skim milk is available.
5. Calculate the multiples for a 100 lb. unit of standardized product, from which the requirements for any weight of finished product can be determined.
6. Utilize scales *A* and *B* on the slide rule for any multiplication and division operations involved in this method of standardization of milk and cream.



Dairymen's slide rule for use as an aid in the practical standardization of milk and cream.

First tier of salmon sides hung at top of air-conditioned smokehouse. Successive tiers down to within 5 ft. of floor complete a load of 4,000 lb.



Choice smoked chubs being racked by A. Block, president of Mutual Smoked Fish Co.

Smokehouse Operation *Improved by* AIR CONDITIONING

Costs reduced and product bettered by smoking fish with method using silica gel and gas heat to replace charcoal fires

MILD-CURED salmon is smoked in a new type of smokehouse at the plant of Mutual Smoked Fish Co., Paterson, N. J. This new smokehouse handles from 8,000 to 9,000 lb. of salmon per week under drying conditions which supply 1,300 cu.ft. per minute of fresh air at 40 to 45 per cent relative humidity and a temperature of 80 to 90 deg. F. Gas fuel is used to dehumidify the circulating air, so that the only fire in the smokehouse is that needed to keep oak logs smoldering so as to impart a smoked flavor to the drying fish.

The Mutual plant has seven smokehouses and handles a total of 30,000 lb. per week of various kinds of fish. It adopted the new method for salmon smoking in order to avoid the possibility of "burning" or "overcooking," which would make the fish mushy, fragile and of unattractive appearance.

It is thought that this smokehouse is one of but two in existence where the air-conditioning method of fish drying is used. It measures 25 ft. square and is 20 ft. high, having a capacity of 12,500 cu.ft. The only other smokehouse operated by this method is much smaller, having a capacity of about 780 cu.ft.

Another feature of the Mutual smokehouse is that only fresh, dry air is circulated. In other, smaller installation, the dry air is recirculated. If in the future the heat and humidity loads in the Mutual smokehouse rise above the designed level, it may be found advisable to recirculate there also. In that case, the adjustment can be easily made.

Mutual's new smokehouse is supplied with 1,300 cu.ft. of air per minute, at 40 to 45 per cent relative humidity and 80 to 90 deg. F. dry-bulb temperature. This air is supplied from a Bryant No. 14 silica gel air conditioner, heated with city gas fuel. This gas heat is used to reactivate the silica gel, after it has absorbed all the moisture possible, there being an arrangement in the design so that one group of silica gel beds is in use while another is being reactivated. Control is automatic. The gas burners use 275 cu.ft. per hour of 525 B.t.u. city gas. There is an electrical load of 2 kw. for operating the blower and other devices which are part of the air-conditioning unit.

After the air is dried, its temperature is around 150 deg. F. To reduce it to the required 80 to 90 deg. F., it is passed through a Trane cooler of the finned metal coil type in which water at 45 to 60 deg. F. is circulated within the coils. In winter, when the outside air is usually dry and cold, dehumidification is generally not needed, and hot water is circulated in the cooler coils to warm up the fresh air to the desired temperature.

For humidity control, a humidistat is located in a small duct through which air from within the smokehouse is constantly drawn. When the humidity in the smokehouse rises above 45 per cent relative humidity, the control operates, causing the blower to pull more air through the dehumidifier and take less air direct from outdoors. When the humidity in the smokehouse approaches 40 per cent relative humidity, the humidistat control causes the blower to pull less air through the dehumidifier and take more air direct from outdoors.

The smokehouse is a brick-walled room with an insulated roof, and with all windows painted over to exclude sunlight. Conditioned air is admitted by means of a duct which runs horizontally along one wall, about 5 ft. above the floor, and has three evenly spaced outlets equipped with dampers. Damper control in the duct regulates the flow. Circulation in the smokehouse is accomplished by means of a propeller type fan located about 6 ft. above the duct, supplemented when necessary by small fans spotted to keep the air moving correctly in accordance with the distribution of the fish loaded into the smokehouse. Exhaust is at the top of the room, in the same wall in which the inlet registers are located.

▶ Gradually, air conditioning is proving itself to be a more and more valuable tool for the food processor. This article records one more successful application of air conditioning and is worth attention from

Food Engineers
Fish Processors
Meat Packers

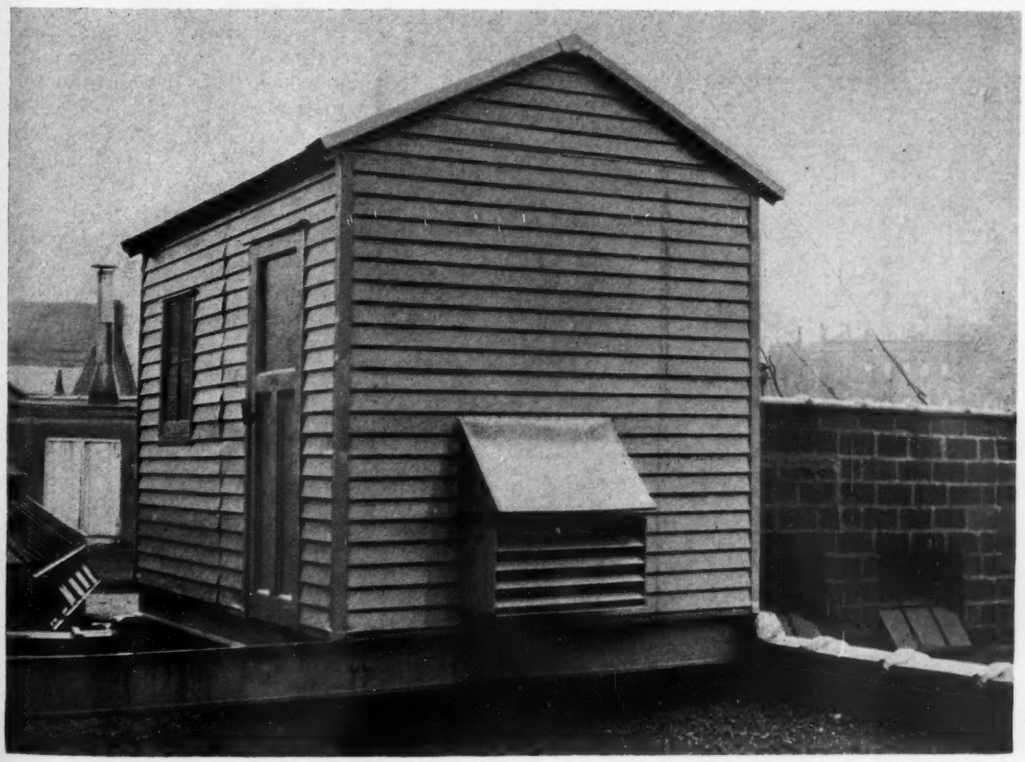
Space has been saved in the plant by placing the dehumidifier and cooler in a penthouse on the roof, as shown in the accompanying photograph. This is possible because the installation requires very little attention. It needs only to be started after the smokehouse is loaded with fish and turned off when the drying is completed. Otherwise, operation is automatic. This fact is responsible for a large part of the advantage coming from the new installation. Compare its simple operation with the old system of drying by heat developed by fires within the smokehouse. The old system required labor for laying and lighting smokehouse fires, for constantly checking temperatures and adjusting heat input to keep temperatures at the correct point and for cleaning up fires when the cycle was completed.

With the old system, it took ten hours to cure a load of 600 to 700 sides of salmon (8 to 10 lb. per side). The new system does this work in six to eight hours. Cost for gas per day with the new system is $1.20, compared to $1.70 spent for charcoal under the old method.

In the matter of quality, the new system has made a great improvement. There is less hazard of "burning" or "overcooking." The fish do not blister or "crack out." Pieces of all sizes receive the same cure, with complete avoidance of variations in flavor.

No special methods of fish preparation need be followed with the air-conditioned smokehouse, the fish being cleaned, soaked, prepared, loaded and handled as before. The fish sides are racked in the usual manner and permitted to drip from 15 to 30 minutes before the dried air circulation is begun. Smoke from smoldering wood is circulated for only the first two hours or so of the drying cycle.

Advantages of the air-conditioning smoking system are listed by Mutual Smoked Fish Co. as faster drying, increased capacity, greater convenience, better quality and more uniformity of product, and lower cost.



Air-conditioning apparatus is in a penthouse on the roof above the smokehouse, thus conserving floor space

Simple System *Saves Water* IN CANNING PLANT

Partly used water recirculated through floor drains instead of flushing them with fresh water

By L. M. JORDAN
John H. Dulany & Son
Exmore, Va.

To secure good water in quantities is quite a problem in the locality of our plant, even though we are only a few miles from the Atlantic Ocean and from Chesapeake Bay. Which means that to keep operating costs in line, steps had to be taken to reduce the amount of water used in the plant. This water economy is effected by recirculating partly used water through the plant drains by a centrifugal pump. By this method the drains are kept clear of solid waste, as anything dumped into them is immediately carried to the liquid waste separator. (It is called liquid waste because it does not include any sanitary sewage.) And with the recirculation system of flushing, it is not necessary to draw heavily upon the fresh water source to keep the drains clear.

How the sewage system is arranged is illustrated in the drawing. There are, as shown, three floor drains to carry off the waste from our canning operations. These drains are concrete channels built even with the floor, and they measure 15 in. in width at the high end and are 14 in. deep. Z irons are set into the sides at the top to carry the drain covers, these covers being made of oak slats 1¼ in. thick, 5½ in. wide and 17 in. long, strapped three together; they are removable. Into these drains go all of the water from the machines, floors and every source, together with the floor cleanings, to be carried from the drains through an 8-in. pipe to the sewage separator. In the separator the solid substances are removed and are then deposited in a pit on the outside of the building from which they are hauled away.

▶Profit margins in food products being what they are, savings in production costs are quickly felt in net earnings. One of the places where many food plants can cut costs is in the water bill. So there may be an idea in this article for

All Food Manufacturers

It is from this liquid waste separator that the water is recirculated through the drains. The overflow in it is 3 ft. above the concrete floor of the pit so as to keep a 3-ft. reserve of water at all times. Located in the separator pit is a centrifugal pump. This pump delivers partly used water from the pit through a 3-in. pipe line to the head of each floor drain, as shown on the drawing. Connecting this line with each of the drains is a 2-in. take-off equipped with a gate valve. These valves are regulated so as to keep a constant flow of partly used water through the drains from the centrifugal pump in the separator pit. This recirculated water is freshened by water from the plant coolers and from the rain down-spouts of the building. And there is a connection to the recirculating system whereby fresh water from our deep-well pump can be injected when necessary.

To secure for our plant operations an adequate supply of water free of minerals and odors, we had to drill a well 228 ft. deep. This well has a 6-in. casing and delivers a flow of about 200 gal. a minute. The water is raised by a Pomona turbine pump which discharges into a water tank equipped with a liquid-level control that automatically maintains the desired pressure on the water system. The valve on the tank can be set for a minimum and a maximum level, or pressure, and the pump does not operate while the level is between these limits.

Fresh water from the well is used for all processing and cooling operations and also for general cleaning.

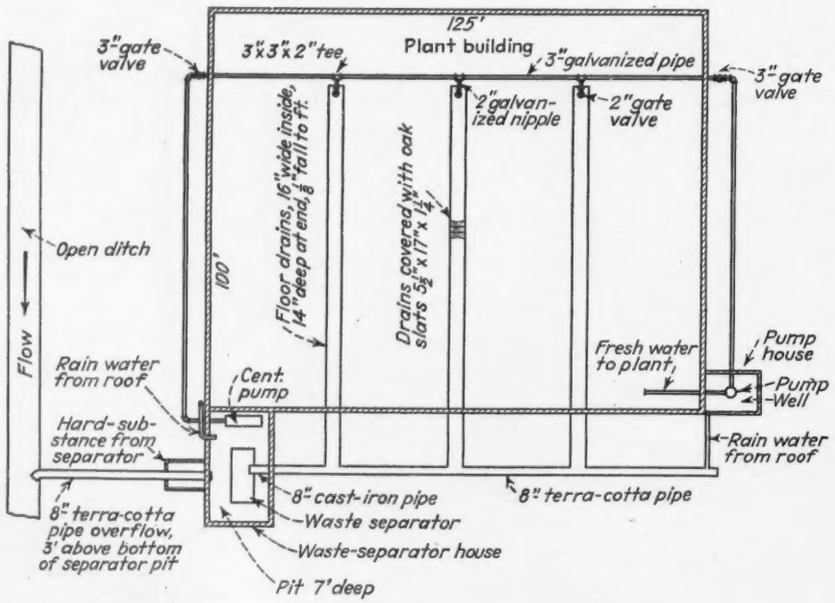
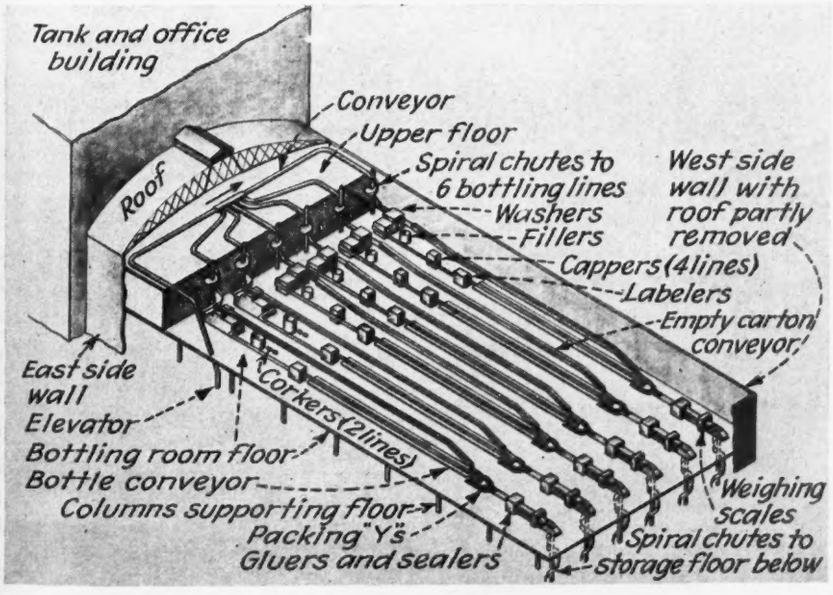


Diagram of waste disposal system and arrangement for recirculating partly used water through floor drains. This cuts the water bill by the cost of the fresh water which otherwise would be needed to flush the drains.

Although this packaging plant is 96 ft. wide and 190 ft. long, there are no columns to support the roof. Trusses strong enough to carry the roof and ceiling load span the width of the plant. This gives clear floor space which facilitates laying out the production lines for high efficiency and permits easy changes to meet future demands. Strong natural lighting and good ventilation are obtained through a monitor section in the roof and an almost unbroken expanse of windows along the sides. This contributes to the efficiency of workers.

It's Good Enough to Copy —This PACKAGING PLANT

Highly efficient today, the layout will permit equal efficiency under different demands of the future



To attain a production capacity of 18,750 cases a day, there are six packaging lines in the plant. Equipped with automatic machines, the lines are arranged for straight-line, efficient operation. Materials come in one end of the plant and the completed packages leave the other, with no cross or counter flow or manual conveying of materials or product. To eliminate the inefficiency of frequent change-overs, the lines are adjusted for different sizes of containers.

By W. F. HOVEY

Sanderson & Porter, Engineers and Constructors, New York, N. Y.

HIGH efficiency today, with complete flexibility for meeting the demands of tomorrow, are built-in features of the new bottling plant of the Penn-Maryland Division of National Distillers Products Corp., Carthage, Ohio. Having a capacity of 18,750 cases per day, the plant is set on a completely unobstructed floor space 96 ft. wide and 190 ft. long. There isn't a single column in the place, and if in the future it becomes advisable to rearrange any or all of the six packaging lines extending the length of the floor, there will be no barriers.

There are no columns in this plant because trusses strong enough to support the entire roof load span the 96-ft. width of the plant, these trusses being hidden by a sound-absorbing ceiling. (Details of the roof design are shown

▶ ***Much that can profitably be used by food manufacturers is incorporated in the layout and construction of the plant described in this article. Carbonated beverages, tomato or fruit juice, beer, wine or liquor, the basic principles of efficient packaging are the same. Furthermore, the construction of the building housing this plant is of a type that can advantageously be used by***

All Food Manufacturers

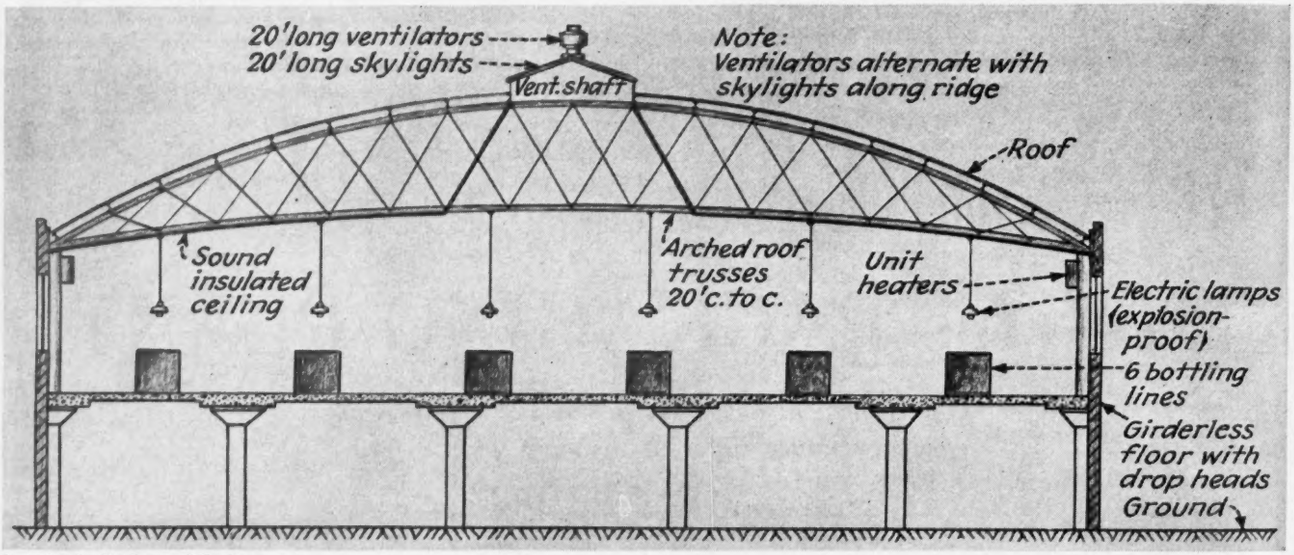
in an accompanying drawing.) Extending lengthwise of the roof over the center of the room is a monitor section providing light and ventilation. Light and air from the sides are admitted through an almost unbroken expanse of windows, providing a plant both well lighted and well ventilated, adding to its efficiency both as a factory and as a showplace.

Not only is the floor space unobstructed by columns, but it is not cluttered up with trucks and dollies so frequently employed in moving supplies into and out of a plant. Everything is brought into the plant by conveyor, and everything leaves the same way. Power and live-roller conveyors, traveling 150 ft. a minute, run to and from the bottling room and the shipping and storage areas. These provide all the transportation facilities for the empty and filled bottles and cases throughout the plant. An "underground" conveyor system carries bottles and other supplies direct from the freight cars to the basement storage rooms.

Assisting the materials handling system in boosting efficiency in the plant is the engineered layout of the six complete bottling lines. These lines are equipped with high-speed automatic machines and are arranged in parallel for straight-line production, as shown in one of the drawings. To eliminate the inefficiency of too frequent change-overs to different sizes of containers, two of the lines are set up to handle quarts and fifths; two, pints; one, half pints; and the remaining one, any sizes from miniatures to quarts. Any one of the lines, however, may be converted to the other sizes if necessary.

For further flexibility in this packaging plant, the machines in each of the lines are equipped with variable-speed drives. This permits the pace of the line to be regulated to the particular size and style of container being handled.

Each of the six packaging lines is supervised by a forelady and a line inspector. Upon the shoulders of the latter is placed the responsibility for the appearance of every container coming off his line.



Drawing by Sanderson & Porter

This roof-truss construction makes possible a plant 96 ft. wide without columns to support the roof. This allows easy layout for efficient straight-line production and permits changes to meet future needs.

How the packaging plant looks from the outside. The arched roof is designed to support its own weight without the aid of columns which clutter up the production floor space. At the far end is a tank and office building of modern design.

More Mistakes To Avoid in Packaging

PART VII

EDITOR'S NOTE: ***This series will run for several months until it is completed***

EVERY EXAMPLE is based on actual errors of packaging. Publication of the negative aspects of packaging is frequently more informative than the mere statement of a bunch of rules to follow. Particularly is it important to bring out the reasons why, and the automatic penalties that develop because of making mistakes.

219 **Liner Caused Discoloration**—A very serious case of a packaging mistake occurred recently in the case of a packer of baby food in glass. Rubber liner compound inside the lid contained a good deal of iron, and this united with tannin in the stringbeans to give a dark discoloration.

220 **Oily Pick-up on White Labels**—No difficulty had been experienced with a certain pick-up gum for cold cans until a new line of food was developed that used a white label. Not long after the goods had left the production line, disfiguring oil spots developed on the labels. The new paper was more absorbent than the old, hence the spots; and, being white, it made the disfiguration much more noticeable.

The condition was corrected by changing to a more suitable type of pick-up gum for white labels.

221 **A Collection of Errors**—We are so short of personnel that I am doing the next best thing, of jotting down a few of the conditions that should be corrected:

1. An overfilled glass container may leak or rupture from summer heat or extreme cold.
2. Wet shipping cases, due to exposure to weather or to handling across wet floors, are poor carriers for their contents. (I refer to corrugated or other paper shipping cases.)
3. Stippled bottles call for special adhesives, and special labeling machine adjustments.
4. The time may never come when we may expect the average packing plant employer to avoid extremes of temperature shock on glass containers. Bottles taken from a warehouse at 40-deg. F will not stand a 170-deg. F shot of rinse water.

The converse is true in rinsing off boiling-hot filled containers with cold water outside.

5. Correct sealing for the thousands of products that go into glass containers still remains a subject that requires the help of a specialist. A hasty choice of cap-lining materials or seals almost invariably results in serious loss of merchandise and good will.

222 **Sealing Compound Inadequate**—A packer purchased cans for dried beef. As dried beef does not require a heat treatment for its preservation, but is merely sealed in a can under high vacuum, cans for this product contain a double-seaming compound which is proficient in maintaining vacuum but which is not satisfactory for double seaming when subjected afterwards to high-temperature processes for sterilization. However, the customer packed these cans with a product which was processed at 240 deg. F. against advice to the contrary. The result was that the double-seaming compound failed, and considerable spoilage resulted.

223 **Weather Affects Cellophane Choice**—For packing salted nuts, a manufacturer ordered a large quantity of printed transparent cellulose in the summer time. The cellophane supplied was for summer use. This material was not all used in the warm weather so the remainder was used during cold weather. This resulted in much breakage, because a different type of transparent cellulose should be used for summer than for winter.

224 **Boiler Compound Spoiled Fruit**—Instead of inquiring as to whether or not there were differences in boiler compounds, a canner merely placed his order for a boiler compound, enclosing a copy of an analysis of his water. He did not even specify that he was operating a food processing plant. The boiler-compound supply house furnished him with a creosolic-base compound. The creosols eventually found their way into canned fruits through an open steam pipe used to heat sirup.

Proper consultation with the boiler-compound supplier prior to ordering would have saved him much money.

225 **Phenol Odor in Canned Fruits**—A canner of fruits who hand-stamps code marks on the covers of the cans prior to closure had, on recommendation from a recognized food laboratory, been using phenol-free ink for this purpose. In ordering additional supplies of ink from his supplier he merely requested can-marking ink, failing to specify that it must be phenol-free. As a result he received a supply of phenolic-base ink which, when used, was found to have contaminated a considerable portion of his fruit pack.

226 **Forgot to Heat Can Wash Water**—A tomato pulp canner, wishing to present a clean, good appearing can, decided to wash all of his tomato pulp cans in a trough of hot water as the cans emerged from the closing machine.

This was to prevent any spilled pulp from drying and caking on the cans. The heat of the pulp at the time of filling was sufficient to sterilize the cans without further process, provided the cans were allowed to air cool, which means slow cooling. The canner experienced a considerable loss in his No. 10 cans of pulp. He had forgotten to turn on the steam for his hot water wash. The cans were subsequently washed in cold water, which meant rapid cooling, and which prevented sufficient sterilization from the heat of the pulp itself.

227 **Consumer Complaints**—My eleven-year-old boy, like many others of his age, loves to send in for premiums. In this case, a picture of a battle ship from the ..... Company (manufacturer of breakfast food), offered in exchange for a 3-cent stamp and two ..... cut off their cereal package. The picture arrived only today, badly torn, owing to the fact that the mailing tube broke in the center in the mails. This mailing tube was extraordinarily flimsy and totally inadequate for the job. Result: disappointment and no good will built up. In fact, just the opposite.

But this sort of thing happened the same way a year or so ago with my own company. We offered a chromium-plated premium in exchange for two labels plus 10 cents, or something of the sort. I sent in for one. Here was a case where a premium was mailed directly from the manufacturer of the premium, located in another city. The tray itself was flimsy enough, but the package in which it was mailed was absurdly light. The tray arrived very much dented and quite useless. From which you can see that we all make somewhat the same mistakes.

228 **A Merchandising Failure**—These are the days when a manufacturer closely watches his competitor, and often follows the competitor's lead; but here is a sad experience arising from the foregoing trend. A large and successful manufacturer of foods entered into one phase of the frozen food business. Following the lead of one of his competitors, he equipped himself with more than 50,000 packages, processed the food, shipped it out into the territory, and then found that the market was so unreceptive to the idea that nobody would buy the product. Not only is this product no longer in this manufacturer's line, but the cost of the 50,000 packages, plus his effort, plus other materials, have proved to be a total loss.

229 **Mysterious Loss of Product**—An unjustifiable production loss on vinegar was investigated. The raw stock was bought on a weight basis while the finished goods were sold as fluid ounces. After filling the containers, the laboratory always checked up on the number of fluid ounces of net content. For costing purposes, these fluid ounces were converted into weight per gallon. Numerous laboratory checks proved that the conversion from fluid ounces to avoirdupois ounces was correct. But a constant production loss was still unaccounted for.

After considerable investigation, the discrepancy was traced to expansion of the vinegar between the time of filling and the time of making the laboratory test. During the winter months, the vinegar was stored in a very cool place and the filling operation took place while the temperature was well below room temperature. Although the number of fluid ounces was apparently correct, when the vinegar expanded to room temperature, at which the laboratory checks were made, the amount of expansion of the vinegar was sufficient to account for an apparent appreciable loss when converting volume into weight.

This instance illustrates the general necessity for being sure that checks on fluid capacity are always carried out at a standard temperature, and not on an abnormally cold or abnormally hot sample.

230 **Overbuying Before Testing**—A large food packer, accustomed to buying nearly all packaging supplies in carload quantities, insisted on several carloads of a new, expensive type of wrapping material for use on a new and untried package. When several months had passed and much of the material was still on hand, it was necessary for both the supplier and the purchaser to take a heavy loss which could have been prevented had the purchaser been less anxious to save $30 shipping charges on carload quantities.

231 **No Purchasing Specifications**—The purchasing agent of a biscuit baking organization decided to save a small amount of money by placing a large order for cartons with a new source of supply. Upon delivery the discovery was made that the wrong grain direction of the board stock caused a complete failure of the automatic set-up and lining machine. As grain had not been specified, the cartons had to be used by manual operation, but at a cost of ten times the small saving made on the purchase.

Moral: Set up specifications on all purchases and order accordingly.

232 **Protruding Flaps Make Troubles**—A tea packer had successfully used the same carton from the same source for nearly 20 years. Deciding to dress up his package with a transparent wrapping, he began to be flooded with complaints from all over the country that the packages were received with the wrappers practically torn off the cartons. Everyone was at an absolute loss to understand the reason for this, as the package was small and handled carefully all along the line. Finally, it was discovered that the glued flaps of the carton protruded slightly beyond the end panels, caused by the action of the automatic sealing equipment. A remedy was quickly evolved consisting simply of taper-cutting the carton flaps, thus allowing a reasonable factor of safety for the sealing machine and the subsequent wrapping operation.

233 **Fearful of Change**—While trade publications have been preaching for years that consumers are well able to take package changes in their stride, and will rather expect that improved products will appear in improved packages, we still see ample evidence of the fact that many manufacturers stick to their old packages because of their fears that there will be losses in prestige and sales if the design is changed.

Certainly it is foolish to change a package, just to make a change. But in the modern interpretation of the package, if its sales ability can be improved by changing it, it certainly is unduly penalizing the manufacturer in the form of lost sales if he does not courageously effect necessary changes.

UNITED STATES DEPARTMENT OF AGRICULTURE

Food and Drug Administration

MINIMUM QUALITY STANDARD FOR

CANNED TOMATOES

EFFECTIVE JANUARY 1, 1940

REGULATION under the Federal Food, Drug, and Cosmetic Act for fixing and establishing a reasonable definition and standard of quality for the food known under its common or usual name as canned tomatoes.

From *Federal Register*, July 18, 1939

»»» § 53.041 *CANNED TOMATOES—QUALITY.*

(a) The standard of quality for canned tomatoes is as follows:

(1) The drained weight, as determined by the method prescribed in subsection (b) (1), is not less than 50 per cent of the weight of water required to fill the container, as determined by the general method for water capacity of containers prescribed in section 10.010 (a);

(2) the strength and redness of color, as determined by the method prescribed in subsection (b) (2), is not less than that of the blended color of any combination of the color disks described in such method, in which one-third the area of disk 1, and not more than one-third the area of disk 2, is exposed;

(3) peel, per pound of canned tomatoes in the container, covers an area of not more than 1 square inch; and

(4) blemishes, per pound of canned tomatoes in the container, cover an area of not more than one-fourth square inch.

(b) Canned tomatoes shall be tested by the following method to determine whether or not they meet the requirements of clauses (1) and (2) of subsection (a):

(1) Remove lid from container, but in the case of a container with lid attached by double seam, do not remove or alter the height of the double seam. Tilt the opened container so as to distribute the contents over the meshes of a circular sieve which has previously been weighed. The diameter of the sieve used is 8 inches if the quantity of the contents of the container is less than 3 pounds, or 12 inches if such quantity is 3 pounds or more. The meshes of such sieve are made by so weaving wire of 0.054 inch diameter as to form square openings 0.446 inch by 0.446 inch: Without shifting the tomatoes, so incline the sieve as to facilitate drainage of the liquid. Two minutes from the time drainage begins, weigh the sieve and drained tomatoes. The weight so

found, less the weight of the sieve, shall be considered to be the drained weight. (2) Remove from the sieve the drained tomatoes obtained in (1). Cut out and segregate successively those portions of least redness until 50 per cent of the drained weight, as determined under (1), has been so segregated. Comminute the segregated portions to a uniform mixture without removing or breaking the seeds. Fill the mixture into a black container to a depth of at least 1 inch. Free the mixture from air bubbles, and skin off or press below the surface all visible seeds. Compare the color of the mixture, in full diffused daylight or its equivalent, with the blended color of combinations of the following concentric Munsell color disks of equal diameter, or the color equivalents of such disks.

1. **Red—Munsell 5R 2.6/13 (glossy finish).**
2. **Yellow—Munsell 2.5 YR 5/12 (glossy finish).**
3. **Black—Munsell N 1/ (glossy finish).**
4. **Grey—Munsell N 4 (mat finish).**

It is ordered that the regulation hereby prescribed and promulgated shall become effective on January 1, 1940.

Issued this the 14th day of July 1939.

(Seal)

HARRY L. BROWN
Acting Secretary of Agriculture

(F. R. Doc. 39-2575; Filed, July 14, 1939; 4:21 p. m.)

Minimum Tomato Quality Color Standard

This plate matches the color specified in the foregoing text.

NOTE: The following information is unofficial, yet may prove useful to readers. The color of the plate above may be combined in a single Munsell reading thus: 1 Yellow Red—3.4/8.3. It also corresponds to Plate 4, F-12, Maerz and Paul, "Dictionary of Color," published by McGraw Hill Book Co. Minimum red and maximum yellow are specified. Black and grey ratios are unspecified. This color has 27 per cent black and 6 per cent grey.

THE EDITORS

Give a Man

MORE THAN A NUMBER

Every employee has a name—he and his work should be known by it. Here are some easy ways of bringing this about, with paying results

By RALPH RAYMOND
Bridgeton, N. J.

YOU probably wouldn't admit it, even to your best friend, but it's ten to one that at one time or another your eye has gotten quite a lift from seeing your name in print—whether it be in the local newspaper, or the bulletin board at your club or on your church pew. You're no different from others in this respect. You want to be known. You want to be identified. You want to be recognized.

Every man (except perhaps the criminal) likes to see his name attached to the things he does; he seeks prominence. It might be called a mild form of publicity.

Each man in your factory suffers from this same yearning for recognition in his daily tasks. He, too, would like to be identified a little more—represent something—rather than be known merely by his number, which may mean something to a white-collar clerk in the front office, but to the neighbors along his street or to the boys in his department that number conveys very little esteem.

Whether he realizes it or not, the man in the factory is the victim of one of the effects of the so-called Industrial Revolution. He senses that this modern Machine Age has repressed the ego in him and has reduced his chances for individual recognition.

He sees surrounding him a vast array of elaborate machinery, assembly lines, and other modern technological advances. And he has heard it said that it is these very machines which cause so much unemployment today.

"That's just why so many men are out of work," he has heard them say.

He has come to resent the encroachment of the machine and its competition, and its unremitting audacity.

And furthermore, he could work on this job forever and no one would ever stop him on the street some day and say: "Harry, the wife and I bought one of those XYZ washing machines today. You know, the kind you make. We liked especially well the third bolt on the motor support which we know you have been threading for years. That's what sold it—that third bolt."

Harry is no longer known, except by a very few, for the things he produces. Gone are the days when the craftsman proudly affixed his name to every article which left his bench—to be admired and recognized wherever it might be seen.

The product Harry works on goes to the buying public bearing a modernistic chromium-plated monogram or trademark. Harry's name isn't in the "write-up" at all. His talents, his efforts, his good workmanship, his care and attention are all there—but Harry's name is never mentioned, or even known, outside his department.

The point I've tried to make thus far is this:

The individual workman is repressed in his job today. He has little opportunity to identify himself with the products of his labors. And, because of this, in a great many instances he has lost interest in the product, the job, the department and the company.

Many employers have noticed in their employees this repression of the individual, and have provided satisfactory substitutes which enable the workman to express his individuality in other ways. And these substitutes have been more or less successful. Other employers have had the same opportunity to overcome a portion of this repression among their working force but have neglected it. Their employee relations program has omitted what others have applied with surprisingly good results.

Let us look around us and see some of the things which are commonly used to overcome what we might call "employee repression," the following list is by no means all-inclusive, but it will serve to suggest an idea or two for inclusion in your employee relations program.

1. Girls are used by an eastern bottle manufacturer to inspect the bottles as they are packed in the fiber shipping cases. Each girl has a rubber stamp bearing her full name. She stamps her full name on the lid of each shipping case she packs. Effective? Definitely yes.

2. Some companies include on the time-card (along with the clock number, name, and perhaps Social Security number) the man's job or title. For example: Press Operator, Janitor, Master Mechanic, Inspector.

3. Many companies are using a new type employee identification badge which carries the clock number in small figures and the employee's full name in large letters. The name appears on an interchangeable card behind a celluloid window.

4. An eastern food processor adds dignity to the various jobs in his plant by providing a distinguishing uniform for the various classes of labor. For example: inspectors wear a smart white smock, chefs wear the distinguishing hat emblematic of their trade (their helpers wear the same type hat with a smaller crown), the girls have their appropriate garb, the foreladies another, and the supervisors another.

5. A New York metal stamping shop has a sign over each machine bearing

(Turn to page 537)

Laws Forced by Farm Groups *Halt Trade* in Processed Foods

By IVAN C. MILLER
Distribution Editor, FOOD INDUSTRIES

EVERY state has enacted laws controlling the milk industry. Most states provide milk inspectors acting under milk inspection laws to protect the health of the state's residents and assure them of milk and dairy products produced on sanitary farms under sanitary conditions.

Thus, the state inspectors who inspect the dairy farms in the area around Oshkosh, Wis., protect the health of Oshkosh babies and grown-ups alike, and guarantee them dairy products from sanitary dairies. Presumably the state protection provided to the people of Oshkosh is adequate. Be that as it may, the state of Wisconsin's inspection of Oshkosh farms is not accepted as sufficient guarantee for the health of New York State residents if an Oshkosh dairy ships cream to be made into New York ice cream. A New York inspector must visit, inspect and pass on the Oshkosh dairy farms at a fee, before it is safe for New York people to eat ice cream made from products of the Oshkosh farms. Wisconsin's state inspection will not suffice for New York City, nor is the inspection of New York State inspectors ample to protect the safety of New York City residents. Oh dear no! New York City inspection is required, too. Often it is necessary for dairy products to pass seven and occasionally more inspections before the product can qualify as "safe" for the residents of some municipalities.

Of course, most inspections require a fee—and the more the fees heaped on distant producers, the less competition the faraway producers furnish to local producers.

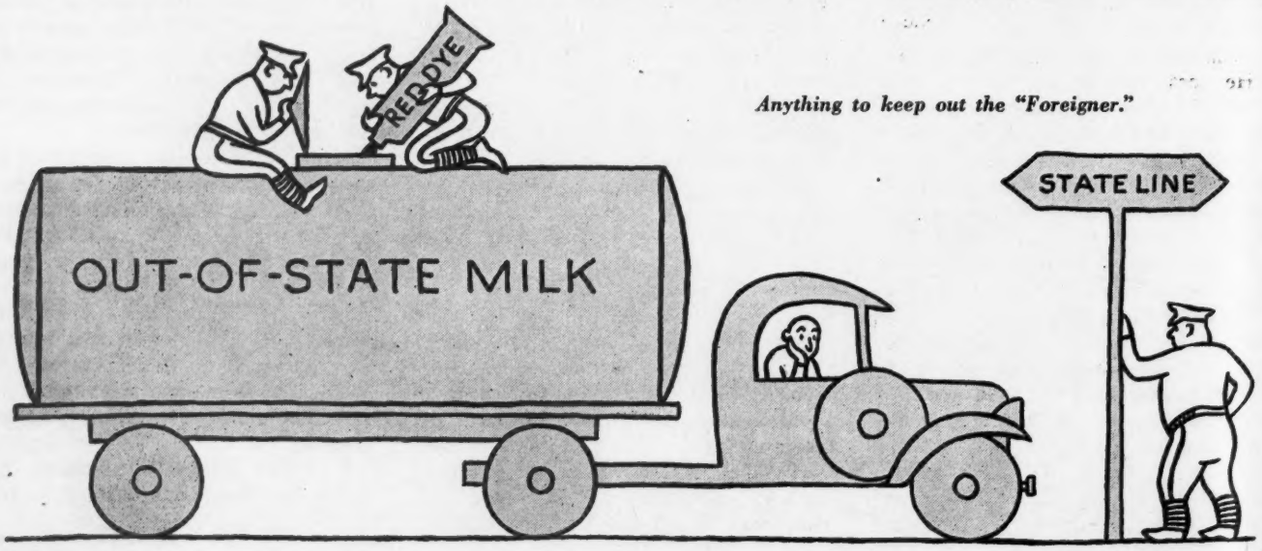
No question can be raised regarding the need of protecting the health of communities and consumers from the diseases and epidemics which can be spread through milk of diseased herds or milk produced under unsanitary conditions. It does seem strange, however, that it requires seven or more inspections of dairy products to safeguard the health of the citizenry of one community, when one of these inspections alone is adequately safeguarding the health of another community consuming the same dairy products, produced on the same farms.

Safeguarding the health of food consumers is a necessary function of government. It must also be conceded as apparent, whether necessary or not, that governments do function to protect the interests of the local farmers. It must also be conceded as impractical, if not impossible, to thus protect local farmers, and the consumer's health—and at the same time protect the consumer's pocket-book.

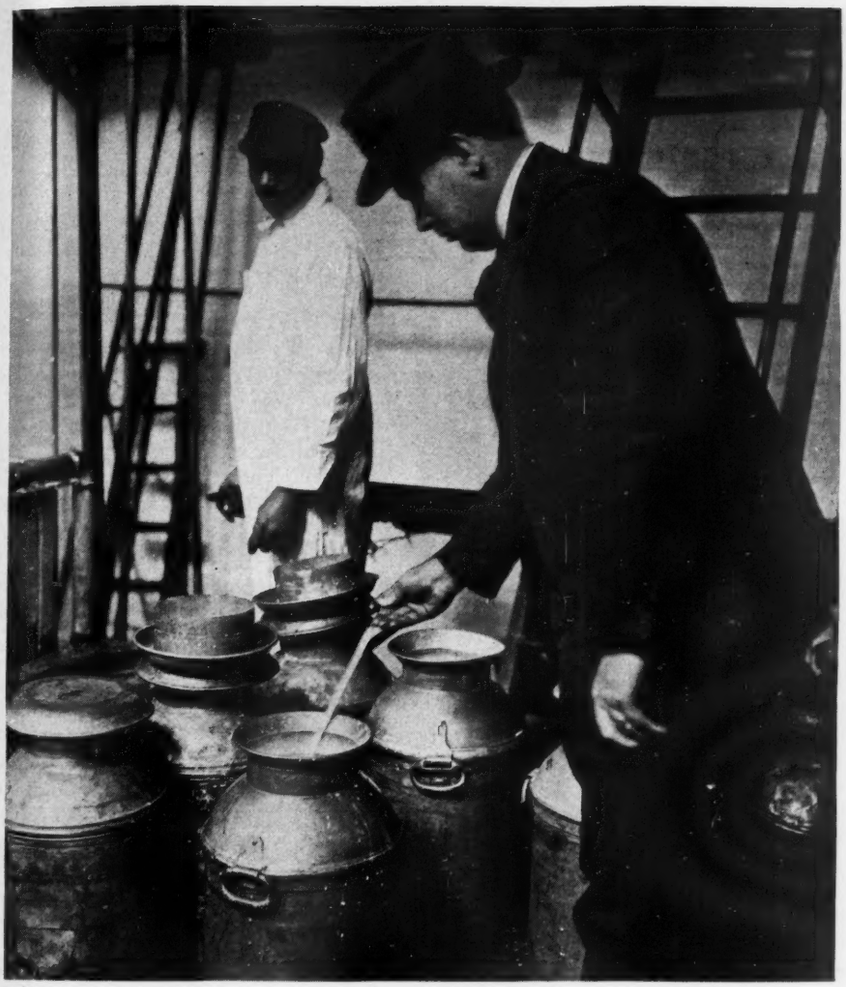
Unfortunately, there is ample evidence over the country that the consumer is squirming because of increased drains on his pocket-book.

Government protects health and the farmer on one side, consumers protect food costs on the other, and the food manufacturer is sandwiched in between. Not that all food manufacturers of dairy products are lily-white when it comes to encouraging local laws to protect home industry. Nevertheless, the dairy product manufacturer is in a vise, squeezed between two opposing forces. This situation demands of the manufacturer of dairy

THE free flow of dairy products has been more restricted by local trade barriers than has any other group of food products. Even manufactured dairy products—dry, evaporated and condensed milk, ice cream mix, cheese and butter face impassible barriers to free trade. Bottled beverages including beer and wine face barbed-wire entanglements at the borders of many states. Bakery products too have had to face blockades. There is no food manufacturer who will not face shrinking markets if the trend toward extending trade barriers continues.



Anything to keep out the "Foreigner."



Drawing a sample of milk for laboratory analysis. Uniform inspection and testing of milk and milk products throughout the United States could amply protect the health of all citizens without restricing free trade among the states and their several parts.

products a program of good public relations—diplomatic public relations.

Probably no food industry has more often faced barriers to free trade than the dairy product industry, nor faced so many of them. In many of the Atlantic Seaboard states—New York, New Jersey, Massachusetts, Rhode Island, Connecticut, Pennsylvania, Virginia and Florida—fluid milk, and often cream, is admitted into the state from without only from farms which have been inspected and licensed, for a fee, by the home state. Farmers and receiving plants shipping into these and other states, may have occasion to ship into more than one. However, there is frequently the possibility that conformity to the requirements of one state violates the requirements of another state.

Although most dairy states have passed laws pertaining to dairies and dairy product inspection, not all of them have used their inspection laws as a means of limiting competition by raising barriers to the free flow of dairy products from other states. Enough states have, however, used dairy product inspection laws to protect local producers to foreshadow similar use by the other states.

Inspection and registration by Massachusetts inspectors of farms from which milk is shipped into Massachusetts is required by Massachusetts law. The cost of inspection and registration is, however, a state expense. According to the Federal Trade Commission's report on the marketing of milk in Boston, . . ." it is not the purpose of the Massachusetts state inspection officer's authority to exclude out-of-state milk." This situation exists regardless of the persistent pressure from state interests to enforce inspection laws for the purpose of limiting out-of-state importation.

Connecticut is less charitable in its administration of dairy inspection laws. The Federal Trade Commission reports "Indications are that Connecticut has used its milk inspection laws advantageously in keeping out milk from other states, although it does not admit this use of its power." Inspection of farms bordering Connecticut in neighboring states has been withheld, permitting relatively little milk to enter Connecticut from without the state. The Connecticut law directs the state commissioners to refuse to inspect farms outside the "natural milk-shed." It would be interesting to know whether or not "natural milk-shed" is synonymous with the farms of local state producers.

Rhode Island has practically eliminated shipments of milk from several states and greatly curtailed the imports from others, through administration of the state's dairy laws. Rhode Island stipulates that normally all milk shipped into the state shall go directly from the farm where it is produced to the consumers or dealers within the state. The result of enforcement of this law on farmers located any appreciable distance from the Rhode Island boundary is obvious. If milk is delivered in violation of this Rhode Island law, the Commissioner of Agriculture of the state is empowered to add colored vegetable matter to this milk so that it may be easily identified—and removed from competition with local products. (On Aug. 10, 1937, red coloring matter was added to 5,000 qt. of milk from Bellows Falls, Vt. Court action was instigated by interested distributors. Rhode Island has not since added color to out-of-state milk.)

Though Rhode Island thus defends the market of state producers of fluid milk, the state does, however, accept out-of-state cream on the certification of inspectors in the state of origin.

There seems to be little consistency in this attitude of Rhode Island—an attitude assumed by many of our Eastern states. Fluid milk from foreign states may sometimes be scrutinized by and bear the tax of as many as seven separate inspections, but foreign cream imported for the manufacture of ice cream, is considered "safe" if passed by the inspection in the

state of origin or often without any inspection whatsoever.

The power of protecting community health—and at the same time local farmers' markets—is not the exclusive function of the states. Many municipalities zealously guard the interests of the local dairy farmers in the territory adjacent to the municipality as a means of guaranteeing the health and safety of the populace.

Some years ago the Commissioner of Health of Baltimore ruled that cream for manufacturing ice cream could not be brought into Baltimore from beyond 50 miles from the city except when "emergency" shortages were declared to exist. The Federal District Court found this ruling invalid. Small towns have their local interests to protect also. Grade B milk for Haverhill, Mass., must be produced within 40 miles of town, for Walpole, Mass., within 30 miles and for North Attleboro, Mass., within 8 miles.

In 1930, the city of Boston "discovered" western cream to be "unsafe" for Bostonians and excluded it through inspection requirements. The experiment was soon abandoned, however, because western cream used for ice cream in the area surrounding Boston adversely affected Massachusetts cream in the Boston market.

There are ways of preventing the influx of foreign dairy products other than by limiting the inspection area. Obstacles may be raised to the licensing of new producers. Inspection may be promised but indefinitely delayed. Higher standards may be required (and not infrequently are) of new producers who wish to enter the milk shed. Expensive alterations or the purchase of new equipment may be required to dissuade new producers from attempting to supply a local market. San Francisco places obstacles in the way of new outside competition by an unwillingness to extend inspection services to new areas or by prescribing stringent regulations and rules regarding milk houses, farms and refrigeration for new applicants.

The enforcement measures of different municipalities may vary—the objective is usually the same. In many municipalities (Chicago one of them), the area in which dairy farms may be inspected for the purpose of supplying the local market is left entirely to the uncontrolled discretion of the health authorities. This aggrandizement of the local boards of health not only places in their hands sanitary control of the quality of the milk but economic control over the price, since the board of health regulates the supply.

State dairy laws, ostensibly enforced to protect health, which functions as barriers to out-of-state trade, affect not only out-of-state farmers but also in-state manufacturers, whose raw material is milk and whose market may be interstate. The cost of raw materials in-state is fixed, the seller's market for manufactured products in and out of state still admits of a considerable degree of the competition of free trade.

Milk inspection is a necessary function of government to protect community health. When, however, inspection is piled on inspection—usually at a fee—milk inspection becomes a means of removing the competition of the favored local producers.

State laws which act as trade barriers are closing in on manufactured food products as well as raw materials. When a system of inspection of fluid milk and cream functions to remove outside competition the trend is toward extending such inspection to all dairy products including ice cream, ice cream mix, cheese, butter, evaporated and condensed milk, to protect the interests of local producers.

Largely because of the relatively high prices of fluid milk in most communities, there has been a very rapid increase in the consumption of evaporated milk (see the table). Producers of fluid milk apprehensive of this trend have endeavored, and in some cases succeeded, in forcing legislation unfavorable to evaporated and condensed milk.

In one city in Ohio, municipal regulations require that all evaporated and condensed milk sold in the city must come from farms inspected by its officials. One company has had to bear the expense of sending inspectors to inspect far distant farms in Wisconsin. Ice cream manufacturers in Pennsylvania who use dry milk, must either use dry milk produced in Pennsylvania or procure it from companies which have gone to the expense of financing Pennsylvania inspection of their Western farm sources of supply for dry milk manufacturing.

Florida oyster dealers are attempting to get a bill through the Florida legislature to tax imported oysters. This law, if passed, might be limited in enforcement to the importation of unprocessed oysters. However, it is conceivable that the law might cover frozen oysters, and processed, canned oysters.

In view of these and similar laws, disguised as health laws but aimed at protecting home state enterprise, is it fantastic to expect various states to protect local canning plants by passing laws prohibiting the sale of fruits and vegetables from out-of-state canneries unless inspected and approved by home state inspectors?

Louisiana might follow this trend to protect Louisiana sugar interests by prohibiting the sale of canned fruits, beverages and preserves containing any sugar other than cane sugar. Should this happen, Colorado would be certain to retaliate by limiting the sale of products sweetened with any sugar except sugar made from beets.

Disastrous as are the effects of the present municipal and state barriers to free trade, the great danger lies in the certain extension of this trend to cover a great range of manufactured products, unless the trend is not only curbed but reversed.

Plant and Animal Quarantine

During the smallpox epidemic which once raged in this country, no objection was made by the citizenry at large to the use of quarantine. The victims of the disease were too ill to object. Smallpox has practically vanished, thanks to the technic of vaccination, with the aid of isolation maintained through the employment of quarantine.

The establishment of quarantine has greatly aided in stamping out the contagious diseases of animals (such as hoof and mouth disease) and also plant diseases. Quarantine has aided too in localizing infestations from insect pests.

And yet, the National Plant Board in its principles of plant quarantine advises and warns that: "(1) The pest concerned must be of such nature as to offer actual or expected threats to substantial interests; (2) The proposed quarantine must represent the necessary or desirable measure for which no other substitute, involving

less interference with normal activities, is available; (3) The objective of the quarantine, either for preventing introduction or for limiting spread, must be reasonable of expectation; (4) The economic gains expected must outweigh the cost of administration and the interference with normal activities."

In spite of the apparent justification, quarantines have often exceeded their usefulness. They have been employed for purposes other than those outlined by the National Plant Board. They have too often functioned as trade barriers to restrict the free flow of interstate trade.

At the beginning of 1938, there were in force 239 state plant quarantines or general regulations. From state to state the regulations vary as do the laws and regulations on milk inspection, grading, labeling, etc. Occasionally the variations in the quarantines and regulations of nearby states are so great that railroads and truck transport companies cannot comply with the regulations of one state without violating the regulations of the other.

Texas has placed a quarantine on commercial sweet potatoes for eating purposes from the entire state of Florida and some parts of Alabama, Louisiana and Mississippi. California and Arizona agree in their sweet potato quarantine of two entire states, Florida and Texas, but disagree on their quarantines of parts of four other states. South Carolina quarantined sweet potatoes from six states; Tennessee from seven states and New Mexico from eight states.

Twenty-nine states in 1937 exercised quarantines on corn and other products which might spread the infestation from the European corn borer. Three states each quarantined the same ten other states. The number of other states quarantined by each of the 29 states varied from ten to all forty-eight. Other quarantines set up by many of the states against infestation from plant diseases and insect pests vary from state to state in a like manner.

Two examples of the use of quarantine by two different states should serve to indicate to what extent the quarantine can be used to restrict free interstate trade.

A regulation enforced in 1933 in the state of New York required dairy cattle being brought into the state to have passed tests of such severity that only a very small percentage of the dairy stock in the United States could have been expected to qualify. The purpose of the regulation was to make sure that all dairy cattle brought into the state would be free from Bang's disease; but at that time Bang's disease was widespread in the state and no steps were being taken to see that the incoming cattle were placed in clean herds. This regulation measurably reduced the movement of dairy stock from other states to New York state.

During its 1938 session, the Louisiana legislature passed a bill providing for retaliatory quarantine or embargoes. The first section of that act is as follows:

"Section 1. Be it enacted by the Legislature of Louisiana, That hereafter, in order to provide a system of reciprocal quarantines or embargoes between this State and other States, territories and foreign countries, it shall be unlawful for any person, firm, or corporation to ship or transport into this State, or to sell, deal in or to handle in any manner within this State, any agricultural or horticultural plant or plant product from any State, Territory or foreign country which prohibits the shipment from this State of any such agricultural or horticultural plant or plant product by reason of quarantine or embargo of any kind or nature."

Whenever a state law engenders retaliatory regulations by another state, that law, no matter how worthy the cause for its enactment, is, through its enforcement, serving as an economic blockade to free trade.

Food manufacturers are affected by all such laws, most of which at present hamper the free flow of the manufacturer's raw materials, though some already serve as embargoes on manufactured products. The time to forestall the passage of laws which will serve as barriers to the free interstate trade in more manufactured foods is not when these new laws are proposed or enacted, but now, by removing all existing laws which hamper the free flow of trade in any commodity. The food industries have a vital public relations job ahead.

Annual per capita consumption of dairy products in Continental United States, 1925-34 [1]

Year	Butter [2]	Cheese [3]	Evaporated milk [4]	Condensed milk [4]	Milk used in cities and villages [5]	Milk equivalent, all products [6]
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Gallons*	*Gallons*
1925	17.7	4.7	11.1	2.6	38.9	92.1
1926	17.5	4.7	11.5	2.8	39.3	94.6
1927	17.5	4.5	11.5	2.6	39.7	94.4
1928	17.2	4.4	12.4	2.5	39.8	94.2
1929	17.4	4.6	13.7	2.7	40.8	94.3
1930	17.3	4.6	13.6	2.7	40.7	94.8
1931	18.0	4.5	13.6	2.3	40.0	96.7
1932	18.1	4.4	14.3	1.8	40.0	95.3
1933	17.6	4.5	14.1	1.7	38.8	92.7
1934	18.0	4.8	15.4	1.7	37.7	92.6

[1] These data now refer to consumption in Continental United States only which explains some small differences as compared with data previously published.

[2] Includes both farm and factory-made butter. These estimates includes some butter used in other products such as ice cream.

[3] Includes all kinds of cheese except cottage, pot, and bakers'.

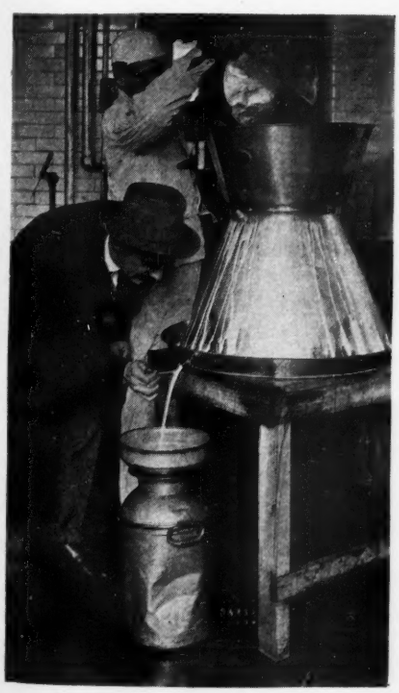
[4] Includes some condensed and evaporated milk used in other products, also includes both whole and skim-milk product. Not corrected for unclassified imports.

[5] Milk and the milk equivalent of cream consumed per capita by that part of the population not on rural farms. These estimates include some milk and cream used in such products as ice cream and supersede estimates previously issued.

[6] Based on estimates of milk production on farms and elsewhere, with milk fed to calves deducted in calculating per capita consumption.

Consumption of butter, cheese, evaporated milk, condensed milk, and milk equivalent of all dairy products is calculated from production, foreign trade, and domestic stocks. Milk used in cities and villages is calculated from board of health reports.

From U. S. Dept. of Agr.



In no field does there seem to be more "professional jealousy" than in the field of milk inspection. Few inspectors are permitted to trust the inspection of other inspectors—especially if they are inspectors of any but the local market.

Hints and Hurdles

Mysteries Will Soon Be Solved

EVER SINCE the "supermarkets" first became an unpredictable and upsetting factor in food distribution, there have been attempts to define the invader. Particularly earnest has been the attempt to put the finger on the characteristics which made it click.

There have been no definite rules by which to catalog "supermarkets" as distinct from other food stores (or are they food stores). Unless cataloged, their sales volume could not be measured. There have been plenty of guesses—guesses as to what stores were "supermarkets," and some fairly accurate tabulations of the sales volume of these guesses.

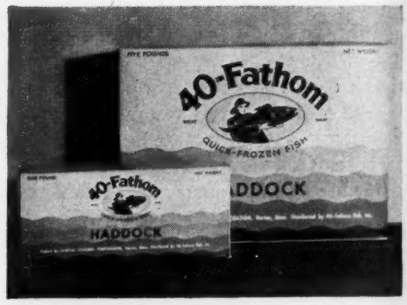
Now the riddle is about to be solved. United States Bureau of Census will include, in the 1940 Census of Distribution, a Census of supermarkets. The Census Department will not declare a definition for a supermarket. None will be necessary. The Census will inquire whether the grocery department of the grocery stores, with or without meat, is self-service. As simple as that! And when the Census reports so many self-service stores, with such and such a total sales volume, that is that, and the matter is settled beyond appeal. A supermarket is a store with a self-service grocery department.

Have a Date With a Fish

DATING has its practical as well as its merchandising aspects. Promoting dates has saved copy writers many of the headaches supposed to result from the exhausting search for a new copy idea. The most recent food item to be dated—and also trade-marked is "40-Fathom Fish," product of General Foods. A tag on the tail informs the buyer when the fish arrived in market. There seems to be a very practical angle to dating fish. "40-Fathom Fish" has recently been packaged for the first time in a trade-marked folding carton.

Cooperation Will Bring Facts

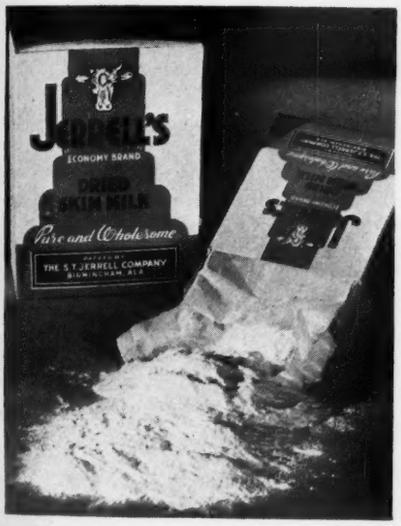
SCARCELY a week passes when FOOD INDUSTRIES does not receive inquiries from advertising agents and food manufacturers for information regarding the market and marketing procedure in the distribution of a large variety of food products. Few if any food manufacturers will disclose the sales volume of their various products, sales by seasons, costs of raw material, channels of distribution, etc. If asked for this information, most food manu-



For the champagne appetite with a beer income, "Grenay," sparkling, 11 per cent beverage fermented from malt, hops and sugar, product of Greenway's Co., Syracuse, can be sold by retail outlets with only a beer permit. This highly carbonated beverage is bottled in heavy green 8-oz. bottles with concave champagne bottle bottoms

Evidence of the self-service store's importance as an instrument of distribution is the fact that some manufacturers are now labeling products so that the labels are legible whether the container stands on end, as is customary in the normal retail outlet, or lies on its side, as is often necessary in the self-service store.

Drug store size



Dried skim milk has long had wide industrial application. Recently dried skim milk, packaged in 8-oz. and 1-lb. containers for consumers is appearing in retail outlets. "Jerrell's" Dried Skim Milk, product of S. T. Jerrell Co., Birmingham, Ala., finds home application in the preparation of milk drinks, ice cream, bread, cakes, etc. This and similar products may find a market and many consumer uses among those who have but limited access to an economical fluid milk market—state trade barriers permitting.

Fixed price label

As the result of the state fair trade laws, a large portion of the products sold through drug stores are sold at a price fixed by the manufacturers. Very few food manufacturers have availed themselves of the "privilege" of price fixing. At least one cracker, product of Federal Sweets & Biscuit Co., Clifton, N. J., has the price printed on the container, 29¢ for a box of 400 crackers. The cartons shown above were bought in a large self-service store where they were priced by the store at 27¢ and sold for that amount.

facturers would retort, and justly, "None of your business." Yet many advertising agents regularly ask for similar market information for the benefit of food manufacture clients, as do the clients themselves.

If a sufficient number of food manufacturers are interested in the market data for a product or group of similar products, there is a way to obtain such data accurately.

The Market Data Section of the Bureau of Foreign and Domestic Commerce will send out market questions and compile market data for an industry without revealing the identity of any food manufacturer nor the sales data of any company. This type of market data is as comprehensive as food manufacturers want it to be. It can be of real assistance to an industry—but it cannot be accomplished unless those manufacturers representing the majority of the commodity's production want the results of the study and are willing to cooperate.

More Food Through Drugstores

THE PROPORTION of foods sold through institutional outlets is growing because of our changing social structure and our increasing use of the automobile (FOOD INDUSTRIES, Feb. 1939, p. 80). The drugstore is one of these institutional outlets which moves a steadily growing volume of both prepared foods and packaged foods. The confectionery and dairy industries were among the first to obtain a profitable outlet for their products through the drugstore. When the soda fountain was converted into a lunch counter, many foods besides dairy products and confections began to move in volume through them. Recently, soup manufacturers have been stocking drugstores with canned soup, chili con carne and similar products in sizes suitable for single serving. Cereal companies also are supplying single portion packages of dry cereals. Among those recently appearing in the drugstore is Ralston Purina Company's "Shredded Ralston," packaged in a transparent wrapped miniature of the retail package.

Indication of Rigid Enforcement

RECENTLY a complaint has been issued by the Federal Trade Commission against a food manufacturer who distributes his products through owned retail outlets. Advertisements of the company refer to the company's products as "home-cooked" and "home-made ice cream." The complaint of the Federal Trade Commission charges that the products are factory-made of the ingredients and by the ordinary methods of production used in factories manufacturing such products for sale. The products are, therefore, not home-cooked and the ice cream is not home-made ice cream. It is beginning to look like food manufacturers will need a few lawyers on their advertising staffs.

Food DISTRIBUTION

From Drug to Grocer's Shelf

TIME was when the juice of figs was known best as a major ingredient in a proprietary preparation. Now fig juice has hopped onto the grocer's shelf, not as a proprietary item of the drugstore, but as a beverage for table use. The product, "Blue Ribbon" mission fig juice manufactured by California Fig Growers and Packers, Fresno, Calif., has recently come to Eastern markets after an introductory trial period on the West Coast. The new juice is processed from dried figs and maintains the properties of its predecessor of drugstore fame.

Victory for Grocers

HORLICK'S MALTED MILK, product of Horlick's Malted Milk Corp., Racine, Wis., was manufactured originally as a baby food marketed through drugstores. There it has remained throughout almost 70 years, one of the few food products sold exclusively through the retail drug channel. Even when malted milk became the main ingredient in, and name of a popular fountain drink, the product remained almost entirely within the domain of the drugstore. For the first time since 1873, Horlick's malted milk is now packaged in consumer packages to be retailed through the grocery store. The new grocery store package is a ½-lb. yellow and brown lithographed can with an easily removed screw-on lid. The malted milk, encased in a glassine bag, is sealed in the can by a waxed paper disk compressed firmly in the top of the can. Although the container is closed with an easily removed screw cover, the product is protected from contamination and other mishaps by the paper seal which cannot be removed without leaving evidence of tampering.

Display Carton Improvement

THE PACKAGE for "Herb-Ox," recently redesigned, is afforded a better opportunity for impulse sales by a new display rack containing twelve consumer packages. Both the package and the display rack are modernized. The package is modernized by more appealing color combinations and simplicity of design; the display rack is modernized by improved color combinations and by improved design which not only increases the visibility of the contained products but which also makes them more accessible to the consumer.

"Nothing to Add"

ONE of the most recent products to bid for favor in the rapidly expanding and highly competitive field of prepared ice cream mixes is "Ready-to-Freeze", manufactured by Sterilized Products Corp., New York, N. Y. According to the directions on the back panel of the label, there is "Nothing to add" in preparing ice cream from this Ready-to-Freeze ice cream mix.

This is in line with the trend toward the manufacture of ready-to-use products. The can contains 1 pt. of a mixture whose ingredients include: concentrated milk, heavy cream, pure cane sugar, maltose, dextrin, dextrose, dried fresh egg yolk, chondrus, chocolate, cocoa, and phosphate. Consumers have a choice of two flavors: vanilla or chocolate. The color combination of the label varies according to the flavor of the mix.

Food DISTRIBUTION

New Packages & Products

Gold Brick in Miniature

NICKEL CANDY BARS and packaged candy range in weight up to 3½ oz. Some nickel confections are as much as 6 in. or more in one dimension. The apparent size of the package of a nickel confection has generally been considered an asset to sales. The introduction of "Gold Brick," product of Elmer Candy Co., New Orleans, reflects a recent trend to merchandise nickel confections on quality alone regardless of size and weight. The Gold Brick's net weight is 1 oz. The confection itself is a pecan nut-filled chocolate not over 2 in. long by an inch wide. The chocolate bar is wrapped in waxed paper overlaid by metal foil and a third outer wrapper of orange-colored transparent cellulose. The orange-colored cellulose transmits to the silver foil a gold luster which gives the confection the appearance of a gold brick. Gold Bricks are packaged 24 to the display carton, the side walls of which are of a heavy transparent cellulose, rising from a gold foil base.

Off the Gold Standard

McCANN'S, Pittsburgh, has recently introduced a new container for "McCann's Cup Selected Tea." An economy was effected in the cost of the package, originally printed on a gold background, by printing the carton in simple colors. The new package is not only less expensive to print, but through more effective use of simple colors has more sales appeal than the former package.

Youngest of an Old Family

WILLIAM UNDERWOOD CO., Boston, the first food manufacturer in this country to employ preserving of foods by canning in metal containers, has recently introduced to the market a new member of its family of products. "PATEFOIE" a canape spread, for cocktail hors d'oeuvres, is packaged in a counter display folding carton containing six cans of spread.

The Underwood company uses a family label for its products. It also employs a family type of packaging for its sardines, deviled ham and other products packaged in small sized tin containers. The label of these small containers is not pasted to the container. The containers are wrapped in paper on which the labels are printed in color.

Appeal Through Visibility

THE NEW GARLIC KERNELS PACKAGE of Gerber's, product of R. Gerber & Co., Chicago, is designed to stimulate impulse sales. The blue and white colors overlayed on a transparent cellulose bag provide a color contrast which attracts; at the same time the transparent cellulose bag permits inspection of the individual kernels of garlic.

A counter display rack in which the bags are dispensed permits them to be placed so they are accessible to the shopper.

New *Prefabricated* Truck Body Is Strong, Light, Inexpensive

Parts are made by mass-production methods in factory for assembly by local body builder

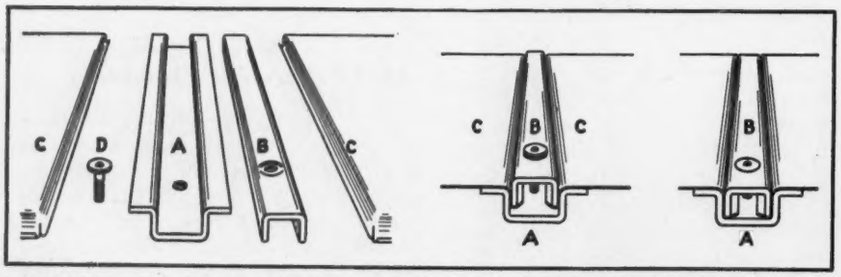
SOMETHING quite different in the way of a body for trucks and trailers has been developed. Constructed of parts formed at the factory by mass-production methods, the body is shipped in knocked-down form to be assembled by the purchaser's local body builder. A new principle of construction, that of bracing the body by putting the panels under tensile stress, is employed to save weight and cost. The body, which is available in 4,000 different sizes, is particularly well adapted to handling light, bulky loads such as foods.

Developed over a period of eight years by Harvey B. Lindsay, president of Dry Zero Corp., Chicago, the prefabricated body is manufactured by Dry Zero and known as the Lindsay Structure.

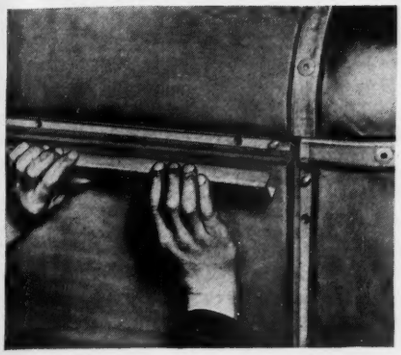
The mild steel parts which make up the body consist of standard framing members, panel sheets and fittings. These are formed on special machinery developed by the company. This standardization of parts does not limit the number or variety of body sizes which may be built. Because the standard panels are made in width from 5 in. to 41 in. and in lengths from 17 in. to 143 in., a body may be built to within ½ in. of any desired size. Some 4,000 different standard sheet sizes and shapes can be manufactured by the machine which forms the turned edges of the panels. There are three different types of body corners, with radii of 1½, 6 and 8½ in.

The various body members are first cut to the size selected, and then usually shipped in knocked down form. Two skilled men have put together a 12-ft. truck body, not including floor or doors, in less than half a day. Insulation may be fitted as desired. No special tools or shop equipment are required for assembling the basic body, except a small socket wrench used for attaching the panels to the framework. This wrench is supplied with the parts.

At first glance, the above body, mounted on a truck delivering bread at the New York World's Fair, looks like any other body. But close inspection shows it to be one of the new Lindsay prefabricated metal bodies, built under an entirely new principle, as explained in the accompanying text. It is 17 ft. long, 6 ft. 8 in. wide and 6 ft. 9 in. high, outside dimensions. It weighs only 1,368 lb. in "galvannealed" metal, before the flooring and interior lining are installed.



The Lindsay principle, in which the body panels are put under tension, is shown in the three sketches above. At the left are the four basic elements, the two adjacent panels C, the flanged frame A, the tensioner B and the socket lock screw D. In the center sketch the four elements are together in their proper places. At the right, the socket lock screw is screwed down into place, making a strong, solid joint. This joint is permanent, unless as in the case of a punctured panel, it has to be taken apart. A damaged panel can be removed and a new one installed from the outside in a short time.

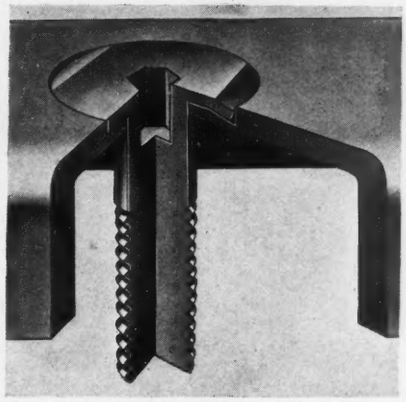


The three steps in putting the panel under tension. At the top, the formed edges of the panel being fitted into the channel and over the flange of the frame. In the center, the tensioner channel is being fitted over the edges of the panels. At the bottom, a socket lock screw is being inserted with the special wrench to force the edges of the tensioner against the edges of the panels and these, in turn, against the bottom of the flanged frame to put the panels under tension.

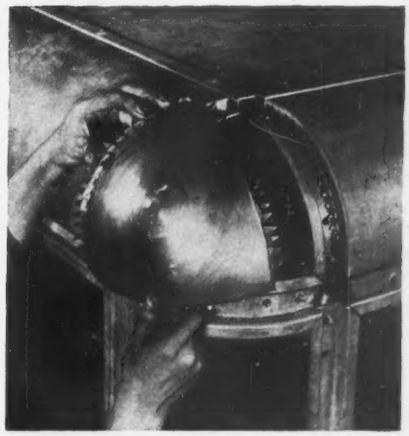
The scheme of assembly has four basic elements; namely, a panel, a flanged frame, a channel bar called the "tensioner" and a socket lock screw. All four edges of each panel sheet are turned up to form a lip all around the panel. In assembly, the adjacent edges of the two panels to be placed next to each other are set inside the flanged frame. The tensioner is then inserted on top of the panel edges in the channel of the frame. Finally, the socket lock screw is inserted through its hole in the tensioner and screwed down into the flanged frame.

The tensioner, bearing against the edges of the panel, pulls them tight against the bottom of the flanged frame and puts the sheets themselves under tension. The socket lock screw binds the whole assembly of panel, flanged frame and tensioner into one solid joint. A special head prevents the socket lock screw from loosening up and backing out under truck or road vibrations.

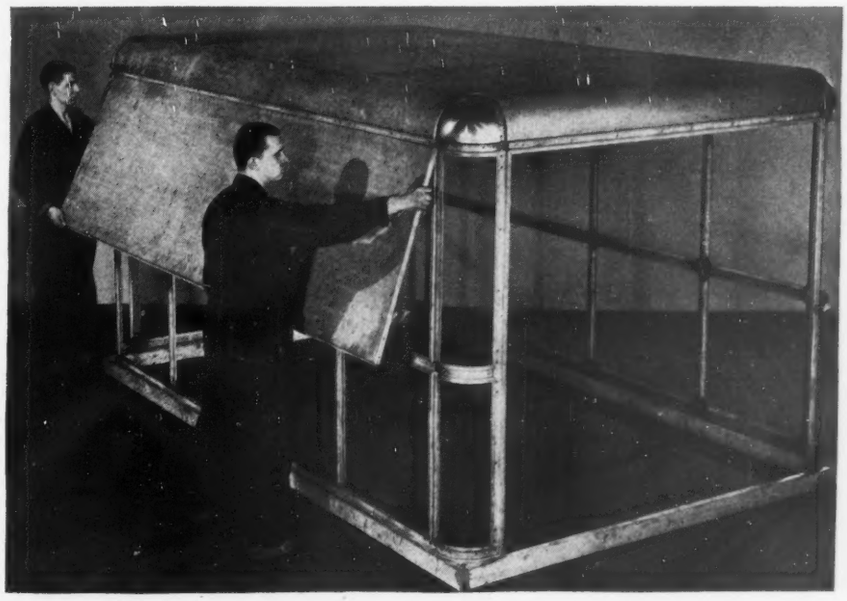
The body attains its strength and light weight by the special method of construction which puts the panel sheets under tension between the framing members. In this way, the full tensile strength of the panel sheets is used to brace the framing, so that no cross-braces, gussets or struts are necessary. Ordinarily, panels are used for covering only.



Cutaway close-up of the socket lock screw, showing how the two opposed chamfered sections on the head of the screw are tapped with a hammer into two corresponding depressions in a seat in the tensioner. This prevents the lock screw from loosening under road vibration but does not prevent the screw from being unscrewed in case a damaged panel has to be removed.



Above, one of the standard corner caps being fitted into place. The edges of the curved sheets are serrated to facilitate smooth shaping of the corner. Below, one of the top side panels being fitted by a local body builder. Because the parts are manufactured by mass-production methods, the Lindsay bodies are less costly than ordinary custom bodies.



Food Technology

NEW DISCOVERIES & INVENTIONS

FOOD TECHNOLOGY

A New Sterilizing Agent

CHLORINE SOLUTIONS are much more effective in destroying bacteria when faintly acid (pH 6) than in the alkaline range (pH 7 to pH 11). Their efficiency can be enormously increased by the addition of 0.25 per cent of an alkyl aryl sulfonate, of unstated composition, which has been shown to be non-toxic. The sulfonate can also be used alone. At 0.35 per cent it is more effective than 255 parts per million available chlorine. It has the further advantages that it is non-corrosive to metals and can be used over a pH range of 6.0 to 10.0.

Digest from "The Fundamental Principles of Chlorine Sterilization and a New and Positive Germicide," by F. M. Scales and Muriel Kemp, read before the Laboratory Section of the International Association of Milk Dealers, 31st Annual Convention, Oct. 17, 1938.

BEVERAGES

Apple Juices and Sirups — English Practice

THE LONG ASHTON RESEARCH STATION of Britain's National Fruit and Cider Institute was established in 1903 and has contributed much toward establishing and maintaining the four essentials in fruit beverages: attractive flavor, correct sweetness-acidity balance, bright color and nutritive value.

Flavor depends on preserving the characteristic balance of esters, ethers and acetals which impart to each fruit its characteristic flavor. The sugar-acid ratio is a matter of taste. German consumers readily accept ciders with as high as 1 per cent malic acid, which would be considered unpalatable in England where the preference is for about half that acidity. Cider apples range from about 0.15 up to more than 1 per cent malic acid and the sweetening must be adjusted accordingly. Removal of part of the acid may be necessary if the apples are very tart.

Color and sparkle depend a great deal on clarity. Pectic substances must be removed to prevent cloudiness, and the enzyme treatment for depectinizing juice within 48 hours after milling solved a problem which was acute and troublesome. The principal nutritive elements in apple juice are fruit sugars and minerals. There is no important quantity of vitamin C in cider, most of it being lost with the skins, but research is still needed to find the optimum conditions for avoiding such losses in making sirup from apples. The probable presence of other nutritive elements complicates the situation, making it difficult to estimate the exact effects of processing on food value.

After clarification by enzyme treatment, cider can be stabilized against fermentation by sterilization (flash pasteurization or passage through a sterilizing filter into sterile containers) or by centrifuging and impregnating with carbon dioxide under 8 atmospheres pressure for storage. This last method, discovered by Prof. Boehi of Switzerland, is becoming the most popular of all. Among retail containers, cans are gaining greatly in favor since the recent development of tasteless wax linings which permit flavor retention for long periods of time.

Apples are exceptionally rich in potassium and have some dietetic value for building up the alkali reserve in the body. In apple sirup, the sucrose used for sweetening is practically all inverted to the more digestible sugars, glucose and fructose. This advantage is not possessed by products sweetened with sucrose immediately before sale or use. Among fruit sirups, that made from black currants is exceptionally rich in vitamin C, which is largely lost to apple juice because it is located mostly in the skin. Black currant sirup has been found to be beneficial in many cases of acute indigestion or duodenal inflammation.

Digest from "Long Ashton Contribution to the Development of Pure Fruit Products," by B. T. Barker, and "Pure Fruit Juices and Sirups," by V. L. S. Charley, *Chemistry and Industry*, 58, 548, 549, 1939 (Published in England).

Beer Made From Wort Cooked Under Pressure

REDUCTION in production costs and increased control over composition of the finished hopped wort are the claimed benefits obtained from the brewing procedure disclosed in U.S. Patent No. 2,163,468. Mash prepared in the usual manner is subjected to three "strong" boiling water extractions. These extractions have concentrations of 20 per cent, 10 per cent and 5 per cent Balling, respectively. When combined in the pressure brew kettle, they give a wort of the desired 12 to 13 per cent Balling, to which the hops may be added in two separate portions as stems and leaves and as lupulin.

Cooking at boiling temperature of 90 deg. R. at 10 lb. pressure, and subsequently at 85 deg. R. at 5 lb. pressure, is done to obtain the customary chemical changes without appreciable evaporation of water. By so doing, the desired "break" comes more quickly and completely and the degree of hop extraction is under better control than when the customary boiling is done with the evaporation of exhaust water. Injection of live steam and compressed air during boiling produces vigorous agitation and the desired degree of extraction of the hops.

By using 20 per cent more solids in the mash than is customary to produce a barrel of beer, the expected concentrations of the three "strong" extractions are assured. A fourth or "weak" extraction of the mash is made and retained for use in the following mash containing the customary 50 lb. of solids per barrel of beer to be made.

The patent has been granted to Carl Rach, New York, N. Y.

Lemonade Powder

IN MAKING BEVERAGE POWDERS, for example lemonade powder, the flavoring material is dispersed or dissolved in edible liquid lactic acid. A method of solidifying the solution is described in British Patent 502,324 (granted June 8, 1939, to Wilhelm Bickel of Berlin, Germany). Before setting

the mass to a solid state it may be sweetened by adding sugar. The preferred solidifying agents are calcium carbonate, calcium lactate and agar. Solidification is effected by stirring the lactic acid solution (sweetened or not) with a quantity of solidifying medium which may be ascertained by test.

CANNING & PRESERVING

Preserving Currant Sirup Vitamins in Storage

THE ASCORBIC acid (vitamin C) in black currant sirup is sensitive to light. As the vitamin is destroyed the color of the sirup also fades, but it is not yet certain that these effects are related to each other. Apparently, temperature is less important than light, for storage at room temperature in the dark preserved the vitamin about as well as cold storage (refrigerator at 32 deg. F.).

The importance of this problem lies in the fact that black currants rank very high in vitamin C content, even higher than oranges, lemons and tangerines. Cold process sirup from black currants, even though more than doubled in volume by the added sugar, and though some ascorbic acid may be lost in processing, still compares favorably with orange juice or lemon juice as a source of vitamin C. Successful storage is therefore highly desirable. A bulk storage test showed about 85 per cent of the original ascorbic acid was still present after 435 days in the dark.

Digest from "Photochemical Decomposition of Ascorbic Acid in Black Current Sirup," by H. T. Fawns, *Journal of the Society of Chemical Industry* **58**, 193, 1939 (Published in England).

Reclaiming Sardine Cooking Oil

THE DEGREE to which peanut oil, used for frying sardines prior to canning, becomes contaminated with the oil from the fish, can be measured by determination of the surface tension by the drop method. Dissolve 10 grams of the oil in carbon tetrachloride and make the solution up to 100 cubic centimeters, then measure the volume of 40 drops from a microburette dipping into distilled water in a definite time. This volume is the "emulsive index" of the oil. Pure peanut oil gives a figure of 47.5, sardine oil of 18.5. One per cent of sardine oil in the peanut oil reduces the index figure from 47.5 to between 43.5 and 45.

The used oil may contain as much as 50 per cent of sardine oil. This can be separated by shaking with water, with which the fish oil forms a stable emulsion while the vegetable oil does not. However, a fishy odor remains in the reclaimed vegetable oil. To get rid of this the emulsification must be carried out with steam, which in escaping carries off the fishy odor by entrainment. Centrifuging, which breaks the unstable peanut oil-water emulsion but not the sardine oil-water emulsion, completes the refining.

Digest from "Researches on the Cooking of Sardines prior to Canning. Application of Emulsive Properties to the Determination of Contamination and to the Refining of Oils," by H. Cheftel and J. Mocquard, *Annales des Falsifications*, January, 1939 (Published in France).

Spray Residues Affect Pectin

THE VISCOSITY of pectin solutions varies with pH, showing a maximum at about pH 5.5. Salts in the pectin, either from the natural salt content of the fruit or from spray residues, affect viscosity. This is increased in the pH range 3.5 to 7.5 by copper and aluminum sulphates, ferric chloride, lead nitrate and arsenious oxide; excess of these cause precipitation of the pectin. Viscosity is decreased by calcium, sodium and zinc chlorides, ferrous, magnesium, manganous and nickel sulphates, and potassium citrate.

Digest from "Fruit Jellies. X. The Role of Pectin-6. Viscosity of Dilute Pectin Solutions as Affected by Metallic Salts and pH," by George L. Baker and Marvin W. Goodwin, University of Delaware, Agricultural Experiment Station, Bulletin No. 216 Technical No. 23, 1939.

Byproducts Made From Citrus Fruit

IN AN IMPROVED PROCESS for recovering useful products from oranges, grapefruit and the like (British Patent 500,281, granted May 4, 1939, to B. Rosenfeld, Palestine) the main treatment is fermentation to produce methanol, butanol and acetone. Pectin is recovered from the spent mash by precipitation with alcohol.

The micro-organism employed for the fermentation is *Clostridium acetobutylicum.* The mash may be made from the peel of oranges or grapefruit, or whole (inferior) fruit may be chopped, neutralized to pH 5, and fermented. When chopped fruit is used, calcium citrate is also recovered from the mash by precipitation with calcium chloride.

If desired, the citrus fruit mash may be supplemented by adding sugar. An example of this is a medium made up from Egyptian cane molasses, to which a fermenting orange peel mash is added.

CONFECTIONERY

Chocolate Substitute

A PALATABLE SUBSTITUTE for chocolate can be made from peanuts or walnuts, according to Holland Patent 45,282 (granted March 15, 1939 to Seiichi Ezaki, Osaka, Japan). The nuts are shelled and freed from dust, fine particles and grit, then ground and steamed for a short time. Fermentation is then effected by means of a suitable sugar-fermenting organism. Sugar may be added at this stage if desired. The fermented nuts are dried, in vacuum if necessary for their protection, and roasted to give a chocolate substitute. Other nuts may be used instead of peanuts or walnuts.

DAIRY PRODUCTS

Preventing Moldy Butter by Treating Wrappers

WHEN THE parchment paper used for wrapping butter prints is soaked in 8, 16, or 20 per cent solutions of sodium or calcium propionates for 2 minutes, butter wrapped with it is materially protected against surface mold growth. Salted butter is much freer of molds with this wrapping than unsalted. The calcium propionate is bitter and gives the surface of the butter a slightly bitter flavor at first which soon disappears. This is a preliminary report and recommendations for strengths to use and method of treatment will be made after further tests.

Digest from "Preliminary Observations on the Treatment of Parchment Paper with Sodium or Calcium Propionate," by H. Macy and J. C. Olsen, *Journal of Dairy Science*, **22**, 527, 1939.

Preserving Cream By Flash Pasteurizing

HIGH GRADE whipping cream with improved keeping quality is prepared by flash heating (in less than five minutes) to 176 to 203 deg. F., maintaining that temperature not more than ten minutes, and cooling rapidly. As described in British Patent 497,649 (granted March 16, 1939, to F. Jung, Bremen, Germany) the detailed procedure may be as follows:

A cream containing 24 per cent fat is homogenized at 50 deg. F. and 200 atmospheres pressure, then preheated to about 108 deg. F. and run into a jacketed vessel fitted with a steam coil and a stirrer. A drop of rennet extract for each 7 oz. of cream is

(*Turn to page 534*)

FORMULAS . . .

Also What Not To Expect of Them

Introducing a new monthly service to readers of FOOD INDUSTRIES

AFTER more than 2,000 persons in the food manufacturing industries have plainly signified their desire to have FOOD INDUSTRIES publish formulas for manufactured foods, in addition to our usual feature article treatment of manufacturing methods and processes, the editors have decided to publish a few formulas every month. They will cover a diversity of products.

This decision has been reached despite the fact that several food technologists have indicated that they have little interest in formulas other than their own.

A formula may be an interesting thing to possess. Also it may be a bit of a hazard if too much unwarranted confidence is placed in it. In nearly every respect a formula for a food product is the equivalent of a sheet of music, like the printed score of Tchaikowsky's "Fifth Symphony." It's the authentic version, but it is not music unless you have an orchestra composed of musicians that know how to play, unless they have their tools (instruments), and unless you know how to lead them. Nor is it financially successful music unless you can hire a concert hall and persuade people to pay good money to listen to your music.

Equally comparable to a formula for a food would be the right amounts of artist's paints and canvas. Unless you know how to paint there is no possibility of a good picture.

Nor could a person produce a good salable story unless he knows how to write, despite the possession of a dictionary, a thesaurus, a grammar and a book that tells how to write a story, plus paper, typewriter and so forth.

All the negative aspects of publishable formulas notwithstanding, they have their place in the scheme of things. Yet it is important to impress on all readers additional negative facts regarding formulas. This is done, lest anyone—particularly those whose careers in food manufacturing are just beginning—place too much confidence in a commercial formula that can be obtained without much cost or effort.

Most such formulas should be considered as only a starting point for much further experimentation and development. The reasons for this advice are many:

Read This Carefully

▶ If you are contemplating manufacturing any food from a new formula—one that you have never tested before—be sure to read the entire article carefully. If, on the other hand, you are a collector of formulas, like collectors of stamps, bird's eggs, butterflies, minerals, matchbook covers, cigar bands, hotel towels or old auto licenses, you can safely pass it by, though it is worth your study.

Remember that you have been warned!

1. The product may not taste right for your market. (Sometimes it may not even taste good—like one that we recently tested.)

2. The cost may be far too high. This is very common.

3. The formula may call for ingredients that are difficult to obtain at certain seasons of the year.

4. The product may require special label designations that ruin its chances for easy introduction, such as prepared mustard containing bran.

5. The product may be illegal to sell in intrastate or in interstate commerce, such as a beverage sweetened with saccharine, or a food containing a forbidden preservative.

6. The product may be wholesome, but wholly lacking in flavor appeal. It may be bland, uninteresting and as devoid of zest as cornmeal mush without salt.

7. Proper specifications for the ingredients may be wholly lacking, such as the type of flour, the moisture content of dried milk, the permissible impurities in salt, the correct blend, e.g., of cocoa beans, to give the flavor you want, the type and extent of cure of ingredients like cheese, the mechanical composition of the raw materials (as in the case of spaghetti) to obtain the proper cooking properties, the correct grade of quality of ingredients, the physical condition of ingredients or the deceptions that may be practiced by some purveyors of some ingredients.

8. Working directions may or may not be given. And even when they are given, they may or may not represent the best way to do the job. Seemingly minor matters—such as the sequence of addition of ingredients, the proper time of their addition, the temperature at the time of addition or the length of time of subsequent manipulations—are often all-important. And two different plants operating on exactly the same formula, as regards ingredients, will often produce foods that differ markedly.

9. Never given in formulas are such obscure yet vital matters as proper pH of ingredient water or its proper mineral salt content, or the proper relative humidity, temperature or other pertinent data regarding the atmosphere in a manufacturing department.

10. The correct method and type of packaging may be as much of a factor in success as the product itself, for a product may deteriorate badly in an improper package, yet aside from a few foods to go into glass or tins these vital data on products are frequently missing from formulas.

Though the foregoing discussion could be prolonged, it is deemed adequate to warn the collector of formulas that he has much work ahead of him if he wants to produce a commercial food that is acceptable to the public and can be sold at a reasonable profit. If all who are interested in publishable formulas will regard them as the basis for extensive further study, they will be adopting the proper attitude. And if any subscriber believes that any formula, however good it may be, is the sole secret of success, he needs to have his head examined.

Some day FOOD INDUSTRIES will publish an article on formula development—the way to proceed to develop a satisfactory formula. But even that will be of little help to you unless you are inspired, have a creative imagination and have a good notion of what you are trying to achieve. All that such an article will do will be to show you how to proceed with some assurance that you can duplicate your previous results—if by lucky chance your results are worth duplicating. And, also, it will give you a safe basis for cost estimates, for these are important figures to carry along parallel with any formula development work. Usually it is not difficult to produce something that is very good if you don't care what it costs. Real skill is needed to produce a very palatable item at low cost.

Many of the formulas to be published in FOOD INDUSTRIES will be for products that have very high quality. Some will be for inexpensive products —quality grade unspecified. None will have been tested by the editors unless it is specifically so stated. Up to now only one formula (for scrapple) has been tested and in this case our suspicions were justified. It produced so punk a product that we would be ashamed even to give it away.

Don't say you were not adequately warned.

As for the significance of the order of the publication of formulas, there is none. If requests come in—and, if we can locate the requested formula—the requests will be handled in order of their receipt.

Finally, FOOD INDUSTRIES expresses its thanks to those concerns and individuals who have graciously permitted the publication or republication of their formulas. In most such cases the sources of the formulas are given. If you like the products resulting from their formulas you are invited to deal with them for such ingredients or advice as they may be able to supply. If you recognize any of the formulas as old acquaintances, it will not be surprising. It is seldom that a really new food appears on the market.—*The Editors.*

Formulas for Foods

Dextro-Milk—a New Product with Possibilities

By
W. J. CORBETT *and* P. H. TRACY
Department of Dairy Husbandry, University of Illinois, Urbana, Ill.

FORMULA NO. 1

DEXTRO-MILK was acclaimed the most popular of a number of special milks served to a group of 70 women at a demonstration on special milk drinks during Farm and Home Week at the University of Illinois. That was the initial reception received by Dextro-Milk, a new beverage developed at this station—a reception which would seem to forecast commercial possibilities for the beverage.

How this interesting new product came to be created involves one of those incidental discoveries familiar to all research men. In previous studies made at this station, it was noted that condensed milk containing dextrose sugars, when held at room temperature, acquired a brown color and caramel-like flavor more rapidly than that containing sucrose. Ramsey, Tracy and Ruehe,[1] in their study of the use of cerelose in the manufacture of sweetened condensed milk, concluded that the discoloration that occurred as the result of the use of cerelose was due to a reaction between this sugar and the milk proteins. It has been further demonstrated that when sweetened condensed whole milk is heated in hermetically sealed cans for a long period of time and at a high enough temperature, the resulting product when cooled, becomes thick enough to slice and has a distinct caramel flavor. It was thought, therefore, that it might be possible to prepare a special milk drink with a caramel-like flavor by heating to a high temperature whole or partially skimmed milk to which dextrose had been added. A series of experiments were therefore planned with this object in view.

The formula which was found to produce the most desirable drink follows:

Homogenized milk with 2 per cent of fat	**87.25 lb.**
Hydrous dextrose	**11.50 lb.**
Plain malted milk	**1.25 lb.**

Heat this mixture to boiling and hold for 75 to 90 minutes. Cool and add vanilla flavoring to taste. Usually the proportion used for ice cream is satisfactory. The addition of a small amount of cinnamon will improve the flavor.

It is necessary to give the milk a prolonged heat treatment in order to produce the caramel flavor. Heating for periods longer than 90 minutes will generally produce a drink with an intense cooked flavor. Heating under pressure to 225 to 240 deg. F. for a shorter period of time (10 to 20 minutes) also produces an objectionable cooked flavor.

The fat content of the milk can be varied from 1 to 4 per cent, but the most economical and desirable product can be made by using milk, containing 2 per cent of fat. If the milk is not homogenized, the albumin will coagulate upon heating and will need to be skimmed from the milk.

The sugar content can be varied slightly without affecting any of the properties of the drink except the sweetness. The range varies between 10 to 12.5 per cent. A high sugar content produces too sweet a product.

The malted milk content can be varied from 1 to 1½ per cent. Higher

(*Turn to p. 532*)

[1] Jour. of Dairy Science, Jan. 1933, Vol. XVI, No. 1.

The Food Industry News

GENERAL NEWS, BUSINESS TRENDS, MEN, JOBS AND COMPANIES • SEPTEMBER, 1939

Standard Can Sizes Submitted to Industry

Adoption of 44 standard sizes of cans for fruits and vegetables has been recommended by the National Bureau of Standards, Washington, D. C., and the standards have been submitted to the industry for approval. The proposed standards, which involve a revision of Simplified Practice Recommendation R155-37, "Cans for Fruits and Vegetables," was drawn up in terms that conform with the broad intent of Bill HR-4402. This bill was introduced by Representative Somers, chairman of the House Committee on Coinage, Weights and Measures. The proposed list of 44 can sizes was prepared from data obtained in a survey by the canning industry and has the approval of National Canners Association.

Buys Surplus Butter

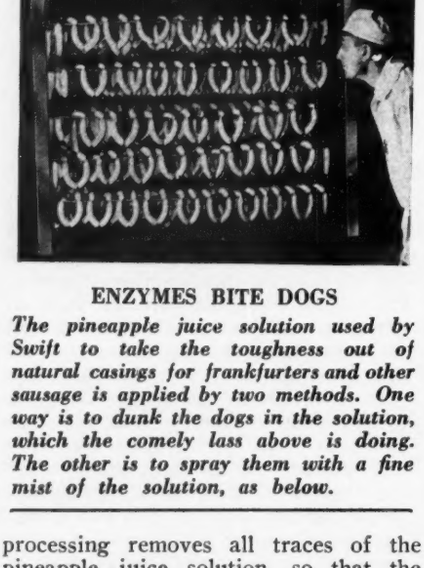
Surplus butter is being purchased on the merchantile exchanges by Dairy Products Marketing Association on the order of Secretary Wallace. This is the first purchasing of the surplus butter under the loan program for the 1939-40 butter storage season under which a Commodity Credit Corp. loan up to $6,000,000 has been approved for the purchase and storage of as much as 25,000,000 lb. of butter. Purchases will be made from time to time in quantities and at prices warranted by conditions. While initial purchases by the DPMA are on the mercantile exchanges, arrangements are being considered for the buying of carlots of butter in storage on the basis of warehouse receipts.

Uses Pineapple Juice To Tenderize Casings

Culminating more than five years of research in the laboratories of Swift & Co., Chicago, comes the announcement that a process has been perfected for tenderizing the natural casings of sausage by applying a pineapple juice solution. The sausage is given a bath in the solution either by immersion or spraying with a fine mist, immediately after the meat is stuffed into the casings. Then the sausages are allowed to hang long enough for the tenderizing action to take place and are smoked, cooked and cooled. This subsequent processing removes all traces of the pineapple juice solution, so that the taste of the product is not affected by it.

The tenderizing action of the pineapple juice comes from the presence of proteolytic enzymes which have the ability to act on other organic materials, peptizing the proteins and thereby softening the cell tissues.

Swift plans to have tenderized frankfurters, in the larger size, on the market very shortly.



ENZYMES BITE DOGS

The pineapple juice solution used by Swift to take the toughness out of natural casings for frankfurters and other sausage is applied by two methods. One way is to dunk the dogs in the solution, which the comely lass above is doing. The other is to spray them with a fine mist of the solution, as below.

Corn Sugar May be Used Without Mention on Label

Victory for the corn sugar interests in their conflict with sucrose refiners is seen in the Aug. 2 ruling of Secretary Wallace. On that date, the Secretary announced that in formulating definitions and standards for foods, the Department of Agriculture will recognize, where the evidence of record justifies, the optional use of sugar and dextrose without declaration of their presence on the label.

This ruling, in effect, perpetuates the corn sugar ruling issued by former Secretary of Agriculture Hyde under the Federal Food and Drugs Act on Dec. 26, 1930. That ruling became void when the Federal Food, Drug and Cosmetic Act, on June 25, 1939, replaced the Act of 1906.

Standards for Foods Issued by Government

Proposed standards for several foods were issued during the past month by the Food & Drug Administration in its work under the new Food, Drug and Cosmetic Act. And final standards of identity were promulgated for tomato juice and catsup. Canned vegetables, preserves and jellies, sweetened condensed milk, evaporated milk, dry skim milk and cream were among the products for which standards were proposed.

Published in the *Federal Register* on Aug. 15, the suggested standards and findings of fact for canned vegetables included the proposal that the Secretary of Agriculture refrain from setting any standards for mixed vegetables at this time. Insufficient evidence to provide a basis for detailed findings covering these vegetables was the reason for this attitude.

The findings in regard to canned vegetables provide that when sugar is an ingredient. it shall be designated on the label, as shall vinegar and spices.

Most significant among the proposed standards for preserves, jellies and fruit butters is a provision permitting the use of sucrose and dextrose, up to a 50-50 proportion, without label declaration of the presence of dextrose. Label declaration of other sweetening agents is called for, except partly invert sugar syrup, and in the case of fruit butters, brown sugar. The sug-

gested standards list 36 fruits as the basis of preserves and 26 fruit juices as basis for jellies. The preparation of preserves from fresh, frozen or canned fruits is permitted. The ratio of the amount of fruit to quantity of sweetening, on a weighted basis, is 45 to 55. The definitions and standards for preserves and jellies were published in the Aug. 11 issue of the *Federal Register*. Public hearings on them will begin Sept. 11.

In the findings on "dry skim milk," the government overrides the proposal of Dry Milk Institute that the name of the product be altered to "dry milk solids" or "dry milk solids, not over 1½ per cent of fat." It is explained that the proposed change would tend to mislead the consumer. The findings provide a standard moisture content for this product of not over 5 per cent.

The findings also override proposed changes and simplification in regard to various terms identifying different types of cream. The names, light cream, coffee cream, table cream, heavy cream and whipping or heavy whipping cream shall be retained, the findings hold. The cream is classified according to the fat content.

The use of sodium bicarbonate as an ingredient in evaporated milk is not justified, the findings on that product hold. In respect to vitamin D, this may be introduced either by irradiation or the addition of a concentrate, but the finished product must contain not less than 135 U.S.P. units of the vitamin per pint. Label declaration of the vitamin is necessary. The definition for evaported milk requires that it contain not less than 8 per cent of fat and 18 per cent of milk solids.

In commenting on the ban of bicarbonate of soda in evaporated milk, the report stated that "all the witnesses who urged the authority to use this product resorted to generalities" and utterly failed to present any clear cut reasons to "indicate the types of fresh sweet milk which can be stabilized by sodium bicarbonate and cannot be stabilized by the use of sodium phosphate or sodium citrate."

Subsidies for Flour And Wheat, Not Lard

Subsidies to increase exports of flour and wheat have been announced by the Department of Agriculture, but apparently the subsidy plan will not be employed to relieve the surplus of fats and oils.

On Aug. 3, a subsidy rate of $1.40 a bbl. on flour exported to Great Britain was announced by Secretary Wallace. And on Aug. 10, the secretary revised and extended the wheat export subsidy program on a basis under which subsidies will be paid directly to exporters on a competitive basis. Exporters will advise the Department of Agriculture the amount of subsidy necessary to finance their wheat shipment abroad, and those offering to handle the wheat at the lower subsidy will be awarded the contract.

Although pressure has been brought upon the government to subsidize the export of fats and oils, particularly lard, Secretary Wallace has made three other proposals for handling this situation. The proposals include: (1) The diversion of some fats and oils from table use to the manufacture of soap. (2) Purchase of lard and other pork products for distribution to the needy. (3) Increasing exports by financing of "sound credit transactions" through the Export-Import Bank.

No Lead in Maple Sirup

Although any trace of lead in maple sirup is banned under the new Food, Drug and Cosmetic Act, in the opinion of W. G. Campbell, chief of the Food and Drug Administration, a transition period in which to meet the new requirements will be allowed. At present, the F&DA is not seizing samples of the sirup containing less than 0.01 grains of lead per pound. But the industry is warned that this is not a tolerance in the usual meaning of that word, but merely leniency to allow time to meet the strict requirements of the law.

Demurrage Rates Reduced

Changes in railway demurrage and storage rates which will benefit food manufacturers have been announced by Association of American Railroads. To become effective Oct. 1, the changes include an amendment which allows a receiver of a less-than-carload lot five days to claim the freight before it is subject to storage charges. Formerly, only four days was permitted. Under a second change, a consignee of a less-than-coarload lot, who is located ten to thirty miles from the receiving freight station, is permitted ten days instead of five in which to claim the shipment.

Still another amendment reduces the penalty demurrage rate from $5.50 a day to $3.30. Formerly, two days free time was allowed for loading or unloading a freight car, with four days additional at a regular demurrage rate

CAPITAL VIEWS

NEW FOOD STANDARDS—The log jam which held up for some weeks the issuance of new standards of identity for foods has been broken. Secretary Wallace decided the fundamental question regarding the use of other sugars than sucrose when he authorized the standard for tomato catsup. This important policy decision is enabling completion of several other standards, and announcement of these is coming along at frequent intervals.

MANUFACTURER'S CHOICE — By the new dextrose ruling Washington understands that the Secretary of Agriculture offers to industry a considerable freedom of choice of sweetening agents. In many cases this choice will presumably not be limited to sucrose and dextrose, but may also be extended to other optional sugars and sirups when these are proper components of a manufactured food. Commenting on this situation, important industry spokesmen express satisfaction with the Secretary's attitude which affords industry a right to use such sweetening agents as they think are most desirable for the product they wish to make, provided, of course, that these sweetening agents are wholesome and suitable for the foods in question.

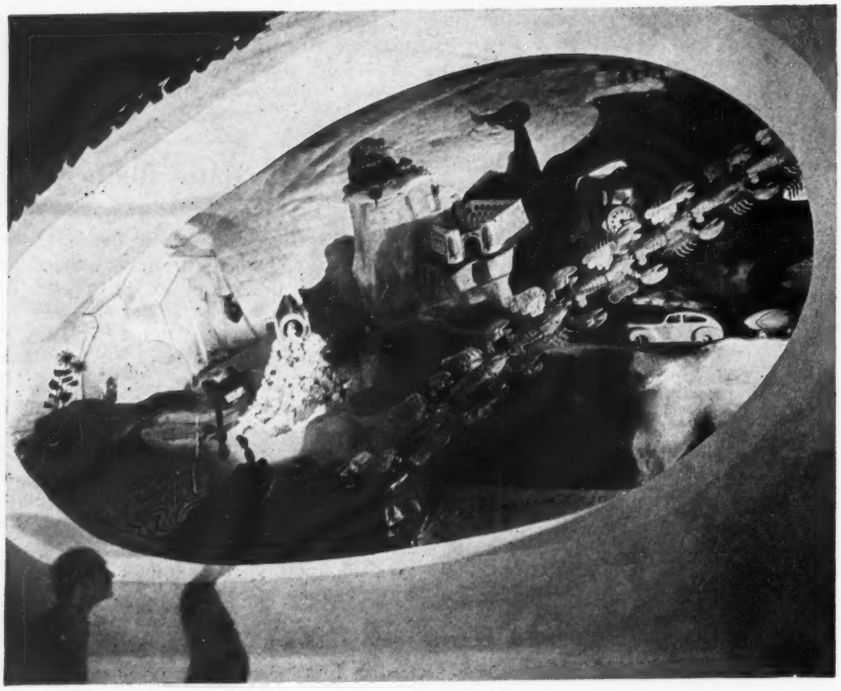
MORE FOOD STAMPS—The Department of Agriculture expects greatly to extend the use of the orange and blue stamp plan during the fall and early winter. Great satisfaction with the experience in six experimental cities is reported. Increase in consumption of the "surplus commodities" is reported. The Department apparently does not have any evidence as to whether the increased use of these surplus goods has in any way cut down on the consumption of other commodities. Makers of manufactured foods may find it necessary to study whether their sales of competitive foods have been so curtailed in the six cities where the stamps have been tried. These cities are Rochester, Dayton, Seattle, Birmingham, Shawnee, Okla., and Des Moines.

The trials at Shawnee are novel, as they include attempts at relief of low income groups who have special rights of stamp purchase. At the other cities, the surplus foods stamps go only to folks like WPA workers.

NO NEW CONGRESS—When Congress left Washington early in August it adjourned the first session of the 76th Congress. When it reconvenes in January it will take up in the second session just where it left off in August. Bills partially enacted will be then in the same status as when they were left last month when Congress adjourned.

BI-WEEKLY HEARINGS—Beginning on Sept. 11 the Food & Drug Administration will present the first part of the fruit preserve, jelly and butter hearings. That series of hearings will probably last all week. It is expected that other like hearings will follow at about two-week intervals. Present indications are that cheese, bread, chocolate and cocoa products, ice cream, and a number of other important groups of foods will be considered for standards of identity in this manner between Labor Day and Christmas.

SHORTER HOURS—Employers are reminded that on Oct. 24 the Wage-Hour Law becomes more rigid in its requirements. From that date 30 cents per hour is a minimum, and 42 hours per week the maximum permissible employment. Some cooperation of the Wage-Hour Division of the Department of Labor is expected. But reasonably rigid enforcement will follow as the newly enlarged staff is organized.



LOBSTERS FLY THROUGH AIR IN FAIR EXHIBIT

This is not a nightmare but a picture of the feature display in the focal food exhibit opened last month at the New York World's Fair. It tells the story of man's achievement in enlarging and stabilizing the diet. The flying lobsters, for example, come up out of the sea and wing their way to the mountains to show how seafood is available at remote inland points. A loud speaker explains the exhibit, while a spot highlights the part being discussed.

of $2.20 a day. Beginning on the seventh day, the penalty rate of $5.50 was applied. Under the new regulations, additional time is allowed without charge when weather conditions delay the loading of a car.

The new rules also allow 72 hours free time for loading and unloading freight cars containing twice or more than twice the minimum weight prescribed by tariff.

May Extend Stamp Plan To 30 Principal Towns

Governmental machinery is being geared in Washington for wide expansion of the Federal Surplus Commodities food stamp plan, and announcement of such extension is expected within a comparatively short time. Officially, the enlargement of the scope of the plan is still being studied. Unofficially it is being privately admitted that the plan has worked so satisfactorily that expansion much more rapidly than was originally expected is now virtually assured.

The expansion, as now contemplated, would enlarge the scope of the plan from the six communities where it is now in operation to a total of between 25 and 30 major cities by the end of the current calendar year, and estimates that it will be operating in approximately 100 cities by the end of the present fiscal year are not lacking.

Lard and vegetable shortening, chiefly from cottonseed oil, have been added to the list of commodities exchangeable for the blue stamps. Shortening is the first of the processed foods to be so added to the list.

Experts of the FSCC, under the direction of President Milo Perkins and Vice-President Philip Maguire, are engaged in study of reports from Rochester, first of the cities to try out the plan, as well as reports from Dayton, the second city. It is stated that these reports are definitely encouraging—even more than expected—and that the results of the study indicate that the way is now open for putting the plan into effect nationally as soon as possible.

It is admitted at FSCC headquarters in Washington, that the Rochester and Dayton figures show heavy increases in the sales of surplus food commodities, in some cases running as high as 35 per cent.

Pending the filing of more complete reports, FSCC officials are unable to give a definite reply to the important question that is being asked by the food trade regarding how the stamp plan has affected the general sales of food products, including the nonsurplus products. Based on the earlier reports, however, Mr. Maguire expresses his confidence that there has been a large overall increase in sales.

Not altogether content with the government's report, grocery groups are moving to obtain more definite information through questionnaires to their members, as to effect of the operation of the plan in the cities where it has been tried out.

Netherlands Indies To Can

Fruit canning will become a local industry in the Netherlands Indies if present plans are carried out. Trade Commissioner Basil D. Dahl, Batavia, has informed the Department of Commerce that successful government experiments in canning have led private interests to plan a factory. This plant will be used to can papaya, citrus fruits, pineapples, tomatoes and various fruit juices. A special canning laboratory operated by the government has been producing canned fruit for some time, and this fruit has met with a ready sale throughout the country.

To Investigate Rail Rates

General investigation of class rail rates throughout the country has been ordered by the Interstate Commerce Commission. The order excepts only the northern Pacific territory. The in-

CONVENTIONS

SEPTEMBER

2– 9—Third International Congress for Microbiology, Waldorf-Astoria Hotel, New York.
5–22—A Summer Program in Food Technology, Massachusetts Institute of Technology, Cambridge, Mass.
11–15—American Chemical Society, fall meeting, Boston, Mass.
18–20—Super Market Institute, Cincinnati.
26–29—American Association of Food and Drug Officials of the United States, Hartford, Conn.

OCTOBER

2– 3—Eleventh Boston Conference on Distribution, Boston, Mass.
2– 4—United States Brewers Association, Waldorf-Astoria Hotel, New York.
3– 5—National Association of Ice Cream Manufacturers, Inc., Chicago.
4—United Brewers Industrial Foundation, Waldorf-Astoria Hotel, New York.
9–11—National Association of Food Chains, Drake Hotel, Chicago.
12–13—Packaging Institute, Inc., Edgewater Beach Hotel, Chicago.
15–19—American Bakers Association, Commodore Hotel, New York.
15–19—Master Brewers Association of America, St. Francis Hotel, San Francisco.
16–20—National Safety Congress and Exposition, Atlantic City, N. J.
17–20—American Public Health Association, William Penn Hotel, Pittsburgh.
23–25—International Association of Ice Cream Manufacturers, St. Francis Hotel, San Francisco.
23–28—Dairy Industries Exposition, San Francisco.
25–27—International Association of Milk Sanitarians, New Hotel Mayflower, Jacksonville, Fla.
26–28—International Association of Milk Dealers, Palace Hotel, San Francisco.
30–Nov. 1—Associated Grocery Manufacturers of America, Waldorf-Astoria Hotel, New York.
30–Nov. 3—American Bottlers of Carbonated Beverages, Palace of Fine Arts, San Francisco.

vestigation, which may cover a period of two or three years, comes as the result of long-standing complaints by shippers in the different parts of the United States who charge that the existing rate structure discriminates against them. It is to cover inter-territorial rates as well as rates within a single rate territory, but will not be concerned with commodity rates as such.

Course in Food Technology

Those who desire to broaden their perspective in the food field, or to increase their technical ability, will have an opportunity to do so at a summer course in food technology to be given at Massachusetts Institute of Technology, Cambridge, Sept. 5-22. The fundamental material of the course will cover the origin, composition, transportation, handling, storage, processing and control of the more important animal and plant foods, with emphasis on chemical, biological and engineering factors relating thereto. This will embrace certain of the processes of the milling, baking, meat packing, canning, dairy, fisheries, refrigeration and quick-freezing industries, as well as some of the food specialties, such as vitamins.

Tuition for the course is $55, and dormitory facilities at $4 per week are available on the campus.

Malt Research Progresses

Progress in research on the malting and brewing properties of different barley varieties is reported by Malt Research Institute. A subcommittee of the Institute has selected the Ladish-Stoppenbach Malting Co., with a plant at Jefferson Junction, Wis., to malt Oderbrucker and Pedigree 38 varieties of barley produced under contract by farmers. And a committee has been appointed to select the companies to conduct brewing experiments on the lots of malt and arrange standard records on evaluating the products made from the malt.

Bottlers May Attack Law

Attack on the new Food, Drug and Cosmetic Law at the next session of Congress is seen in the stand taken by the carbonated beverage bottlers. Officials of F&DA fear that the bottlers' move will be the spearhead of a concerted drive against the law, seeking amendment or repeal of some vital sections of the act. The fight of the bot-

Schedule of Action on Food Standards

	Docket number and commodity	Type of standard or regulations	Presiding officer	*A* First announced in Fed. Register	*B* Initial hearing date	*C* Preliminary briefs due not later than	*D* Examiner's findings published in Fed. Register	*E* Secretary's order published in Fed. Register	*F* Effective date of order
1-A	Tomato puree	Identity ..	J. M. Fox...	Dec. 15, '38	Jan. 16, '39	Feb. 27, '39	April 4, '39	July 18, '39	Jan. 1, '40
1-B	Tomato paste			Dec. 15, '38	Jan. 16, '39	Feb. 27, '39	April 4, '39	July 18, '39	Jan. 1, '40
1-C	Tomato catsup			Dec. 15, '38	Jan. 16, '39	Feb. 27, '39	April 4, '39	July 29, '39	Jan. 1, '40
1-D	Tomato juice.....			Dec. 15, '38	Jan. 16, '39	Feb. 27, '39	April 11, '39	July 29, '39	Jan. 1, '40
2	Canned tomatoes ..	Identity, quality, fill, substandard labeling.	J. M. Fox...	Dec. 15, '38	Jan. 15, '39	Mar. 10, '39	April 12, '39	July 18, '39	Jan. 1, '40
3-A	Eggs	Identity ..	J. M. Fox...	Dec. 15, '38	Jan. 23, '39	Mar. 13, '39	May 10, '39	July 20, '39	Oct. 17, '39[6]
3-B	Liquid whole eggs...			Dec. 15, '38	Jan. 23, '39	Mar. 13, '39	May 10, '39	July 20, '39	Jan. 1, '40
3-C	Liquid mixed eggs...			Dec. 15, '38	Jan. 23, '39	Mar. 13, '39	May 10, '39	July 20, '39	Jan. 1, '40
3-D	Frozen whole eggs...			Dec. 15, '38	Jan. 23, '39	Mar. 13, '39	May 10, '39	July 20, '39	Jan. 1, '40
3-E	Dried whole eggs....			Dec. 15, '38	Jan. 23, '39	Mar. 13, '39	May 10, '39	July 20, '39	Jan. 1, '40
3-F	Egg yolk.....			Dec. 15, '38	Jan. 23, '39	Mar. 13, '39	May 10, '39	July 20, '39	Jan. 1, '40
3-G	Frozen egg yolk.....			Dec. 15, '38	Jan. 23, '39	Mar. 13, '39	May 10, '39	July 20, '39	Jan. 1, '40
3-H	Dried egg yolk.....			Dec. 15, '38	Jan. 23, '39	Mar. 13, '39	May 10, '39	July 20, '39	Jan. 1, '40
4	Coal-tar colors.....	Listing and certification	F. S. Hassell	Jan. 7, '39	Feb. 6, '39	Mar. 3, '39	April 8, '39	May 9, '39[1,5]	May 9, '39[2]
5-I	Canned peaches.....	Identity, quality, fill	J. M. Fox...	Mar. 7, '39	April 10, '39	June 26, '39[2]	.....	.....	.....
5-II	Canned apricots ...			Mar. 7, '39	April 10, '39	June 26, '39[2]	.....	.....	.....
5-III	Canned pears.....			Mar. 7, '39	April 10, '39	June 26, '39[2]	.....	.....	.....
5-IV	Canned cherries.....			Mar. 7, '39	April 10, '39	June 26, '39[2]	.....	.....	.....
6	Canned peas	Identity, quality, fill	J. M. Fox...	Mar. 7, '39	April 17, '39	June 29, '39[3]	.....	.....	.....
7-A	Cream.....	Identity ..	F. S. Hassell	Mar. 28, '39	May 1, '39	July 27, '39	.....	.....	.....
7-B	Whipping cream.....			Mar. 28, '39	May 1, '39	July 27, '39	.....	.....	.....
7-C	Evaporated milk....			Mar. 28, '39	May 1, '39	July 27, '39	.....	.....	.....
7-D	Sweetened condensed milk.....			Mar. 28, '39	May 1, '39	July 27, '39	.....	.....	.....
7-E	Dried skim milk ..			Mar. 28, '39	May 1, '39	July 27, '39	.....	.....	.....
8	Canned vegetables	Identity ..	F. S. Hassell	Mar. 24, '39	April 24, '39	June 19, '39[2]	Aug. 15, '39	.....	.....
9	Coal-tar colors[4].....	Amendment of regulations promulgated by order of May 9 (Docket 4)	F. S. Hassell	June 3, '39	July 5, '39	July 20, '39	Aug. 16, '39	.....	.....
10-A	Fruit jams.....	Identity	M. F. Markel.	Aug. 11, '39	Sept. 11, '39	.....	.....	.....	.....
10-B	Fruit jellies	Identity	M. F. Markel.	Aug. 11, '39	Sept. 11, '39	.....	.....	.....	.....
10-C	Fruit butters.....	Identity	M. F. Markel.	Aug. 11, '39	Sept. 11, '39	.....	.....	.....	.....
11	Cheddar cheese.... / Washed curd cheese. / Colby cheese.....	Identity.....	W. G. Green, Jr.	Aug. 22, '39	Sept. 25, '39	.....	.....	.....	.....
12	Cream cheese.....	Identity.....	W. G. Green, Jr.	Aug. 22, '39	Sept. 25, '39	.....	.....	.....	.....

[1] Typographical errors corrected in Fed. Register, June 3, '39.
[2] Emergency declared to exist, order effective on publication.
[3] Time extended from earlier date previously announced.
[4] Amending order of Docket 4.
[5] See also Docket 9.
[6] No definition or standard ordered for eggs: definition included for each egg product.

Procedure for Fixing Standards for Foods

Standards of identity, standards of quality, standards of fill of container and label specifications for substandard commodities are fixed by the Department of Agriculture according to the following routine (letters at beginning of paragraphs correspond to letters at top of columns in accompanying table):

A. Announcement is published in the *Federal Register* giving tentative form of standards, date and place of initial hearing, presiding officer (examiner) and scope of proceedings.

B. The hearing is held and the examiner prepares and files transcript of record.

C. Announcement is published in the *Federal Register* of the latest date at which briefs in argument or proposed findings of fact, or both, may be submitted by any interested party.

D. Examiner formulates, on the basis of the hearing and briefs, findings of fact and suggested standards. These are published in the *Federal Register*, and a copy is sent to each of those for whom appearance was entered at the hearing. Within ten days after receipt of this copy any person who wishes may file objection to the suggested findings of fact or standards with the Hearings Clerk of the Department of Agriculture.

E. Secretary of Agriculture reviews case and publishes his order in the *Federal Register*, establishing the standards.

F. Standards take effect at some named date thereafter, not sooner than 90 days following the publication except in case of emergency.

Further protest or appeal from the order of the Secretary may take the form of (*a*) comments to him, on the basis of which the case may be ordered reopened, or (*b*) petition to the proper Circuit Court of Appeals of the United States within 90 days of issue of Secretary's order.

tlers is aimed at Sec. 403(i) of the food law, which requires label statements of ingredients. Numerous state bottlers organizations have adopted resolutions calling for amendment to that section by Congress. It is expected that when the American Bottlers of Carbonated Beverages holds its annual convention in San Francisco, it will join the state organizations in the attack on the section.

Surplus Food Purchases Total 1,700,000,000 lb.

Nearly 1,700,000,000 lb. of surplus agricultural commodities costing $66,000,000, with freight and handling charges, were purchased during the fiscal year ending June 30 by Federal Surplus Commodities Corp. With the exception of 15,500,000 lb. of cotton and cotton ticking, the commodities were foodstuffs.

Thirty-eight different commodities were purchased, including 79,000,000 lb. of dried beans, 122,000,000 lb. of butter, 171,990,000 lb. of corn meal, 3,210,000 doz. fresh eggs, 1,950,000 boxes of grapefruit, 58,500,000 cans of grapefruit juice, 13,900,000 lb. of dry skim milk, 61,200,000 qt. of fluid milk, 1,800,000 boxes of oranges, 10,000,000 lb. of dried peaches, 2,264,000 bu. of white potatoes, 20,100,000 lb. of raisins, 66,600,000 lb. of wheat cereal, 178,,000,000 lb. of white flour and 61,740,000 lb. of whole wheat flour.

An average of 2,800,000 families, or 10,446,000 people, received surplus foods every month during the first 11 months of the fiscal year (June figures are not yet available).

Sugar Freight Reduced For Southern Refiners

Unconditional victory for Southern sugar refiners is seen in a decision handed down by the Interstate Commerce Commission, Aug. 11, dealing with suspended rates on shipments of sugar from the Gulf and Southern Atlantic refining points to interior destinations.

This decision is regarded as significant as an indication of the attitude the commission may be expected to take on the even more important pending case based on the complaint of the Southern governors, which charges an unfavorable rate differential against their section and preferential of Northern states.

In its sugar decision, the ICC sweeps clean the contentions of the Northern rail carriers and gives the Southern roads a clear cut triumph, finding that interterritorial rates are to be made on the general level of current rates on sugar throughout the territory east of the Mississippi and in the official and Southern classification territories.

This controversy over sugar rates has been pending before the ICC, in one form or another, for several years and came to a climax in May, 1935, when the Northern lines proposed the rates, now suspended, on which this proceeding is based.

The rates overruled by the Commission include the all-rail rates from New Orleans and Reserve, La., to points in eastern Indiana, Ohio, the southern peninsula of Michigan, Kentucky and West Virginia, and also the rates from Port Wentworth, Ga., to points in Virginia.

Construction News

	Pending (thousands)	Awarded August (thousands)	Total Awarded 1939 (thousands)
Bakery	$3,240	$60	$964
Beverages	460	130	4,458
Canning and Preserving	40	.....	200
Confectionery	.....	.....	75
Grain Mill Products	840	310	3,075
Ice Manufactured	.....	.....	295
Meats and Meat Products	220	.....	457
Milk Products	290	.....	901
Miscellaneous	425	140	2,284
	$5,515	$640	$12,709

New Centrifuge Process Cleans Caraway Seeds

Something new in the way of a seed-cleaning process for food manufacturers has been developed by Sharples Corp., New York. The process, devised at the request of a bakery which uses 800 lb. of caraway, poppy, sesame and similar seeds per day, involves mixing the seeds with water and passing the mixture through a centrifuge. Clean seeds are discharged from the centrifuge on to a screen.

The baker who requested the research leading to this development found that two girls could wash 7 lb. of seeds per hour so that they were fairly clean, it is reported. In the centrifugal test clean seeds were produced at the rate of 200 lb. an hour, and from 200 lb. of seeds there was obtained a bowl cake containing approximately 2 lb. of dirt on a dry basis. All worms and rodent excretia are also removed by the centrifuge, the Sharples Corp. reports. The water used in the process can be used over again in a closed system, since all the dirt is removed from it.

Commodity Prices Reach New Lows

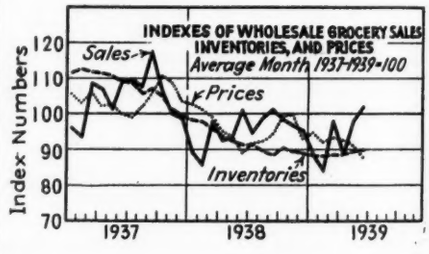
Reacting chiefly to bountiful harvests, but also to continued threats of European war, both general commodity prices and food commodity prices fell during the period ending August 19, with general commodity prices reaching the lowest point since February, 1934.

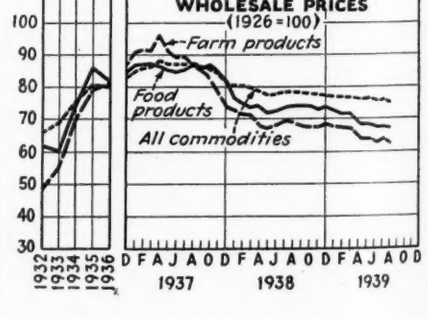
Standing at 75.0 on July 15, the *N. Y. Journal of Commerce's* general commodity index fell off steadily, reaching 73.3 on August 19. For the same period, this same publication's index of food commodity prices declined from 66.0 to 62.1, while the index for grain prices fell from 54.9 to 53.5 during the five weeks.

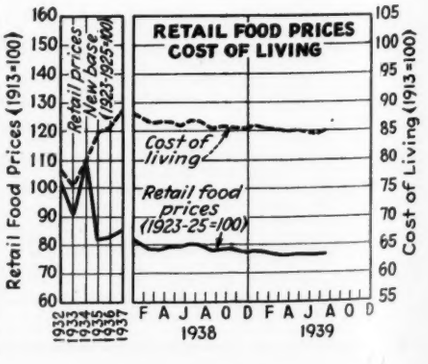
Among the individual foods, wheat, No. 2 dark winter, fell from 63¼ to 62½ cents between July 19 and August 19. Corn was steady during the same period, while rye fell from 59½ to 58⅞ cents. Beef decreased from 15 to 14 cents during the period; lamb also fell from 17 to 16 cents, and pork loins decreased from 17 to 14½ cents. Eggs were steady. Butter increased slightly in price, from 23½ to 24¼ cents; and cheese rose from 14¼ to 14¾ cents. Sugar fell during the period from $2.88 to $2.83, cocoa was stationary, and coffee rose from 7¼ to 7½ cents. Cottonseed oil lost ground, dropping from 4⅞ to 4¼ cents. Canned foods were steady for the period.

Crops Average High

Many crops will be more abundant in 1939 than the respective average yields of the years 1928–1937, according to the August 1 report of the U. S.







Agricultural Marketing Service. Included in those showing higher output are corn, barley, rye, rice, peanuts, sweet-potatoes, sugar cane, sugar beets, hops, apples, peaches, pears and grapes. Wheat yield is forecast at about 3 per cent below the average. Other crops that are likely to be slightly below average include oats, buckwheat, potatoes and pecans.

Among the canning crops, production of green peas and sweet corn are expected to be less than the 1928–1937 average output. In contrast snap beans, green lima beans and tomatoes for manufacture are expected to exceed this average in output.

Hog Prices Dip

After reaching almost unheard of heights during drought years, hog supplies have at last rebounded to normal levels. This was evidenced by the behavior of hog prices in the Chicago market during the past month, when top prices paid for hogs dipped below anything recorded during the past five years. With prices at these levels and supplies ample, pork may be expected to provide increasing competition for other protein foods in forthcoming months.

Data for the Charts

In preparing the curves shown on this and the preceding page of FOOD INDUSTRIES, data were obtained from the following sources: Prices received by farmers, U. S. Department of Agriculture; employment, payrolls, wholesale and retail prices, U. S. Department of Labor; cost of living, National Industrial Conference Board; commodity price index, *N. Y. Journal of Commerce;* business activity index, *Business Week;* data on wholesale grocery sales, inventories and prices are from U. S. Department of Commerce.

INDICATORS

FLOUR PRODUCTION in July, 1939, of 5,667,539 bbl. was reported by *The Northwestern Miller* for mills representing about 64 per cent of total U. S. flour production.

SNAP BEAN PRODUCTION for manufacture in 1939 was estimated on August 1 at 83,500 tons, 35 per cent below the record production of 1938, but 11 per cent above the average for the preceding ten years.

TOMATO PRODUCTION for canning in 1939 was estimated on August 1 at 1,645,700 tons, compared to 1,737,700 tons in 1938 and an average of 1,458,600 tons for the preceding ten years.

SWEET CORN PRODUCTION for manufacture in 1939 was estimated on August 1 at 581,400 tons, 34 per cent lower than the 1938 figure, and 10 per cent below the 10 year average production.

MILK PRODUCTION in 1938, according to the Agricultural Marketing Service, was 107,155,000,000 lb., valued at $1,826,430,000.

BUTTER PRODUCTION in June, 1939, was 200,135,000 lb., compared to 202,540,000 lb. in June, 1938, and to an average of 193,875,000 lb. for June, 1930 to 1937.

CHEESE PRODUCTION in June, 1939, was 68,320,000 lb., 6 per cent below June, 1938, but 21 per cent over the June average in the years 1930 to 1937.

EVAPORATED AND CONDENSED MILK PRODUCTION in June, 1939, was 268,341,000 lb.

OLEOMARGARINE SALES in June, 1939, as indicated by sales of internal revenue stamps, totaled 17,919,202 lb., compared to 24,751,742 lb. in June, 1938.

BEER SALES in July, 1939, were 5,538,406 bbl., compared to 5,386,586 bbl., in July, 1938.

FRUITS, FROZEN, in storage on August 1, 1939, totaled 130,650,000 lb., compared to 152,921,000 lb. a year before, and a 1934–1938 average of 102,629,000 lb.

VEGETABLES, FROZEN, in storage on August 1, 1939, were 63,026,000 lb., compared to 45,851,000 lb. a year previous.

BUTTER in storage on August 1, 1939, totaled 165,094,000 lb., compared to 173,257,000 lb. on August 1, 1938, and to a 1934–1938 average of 131,751,000 lb. for the date.

CHEESE, all kinds, in storage August 1 of this year was 119,291,000 lb. This compared to 134,351,000 lb. a year before and to an average in 1934–1938 of 112,102,000 lb. for the date.

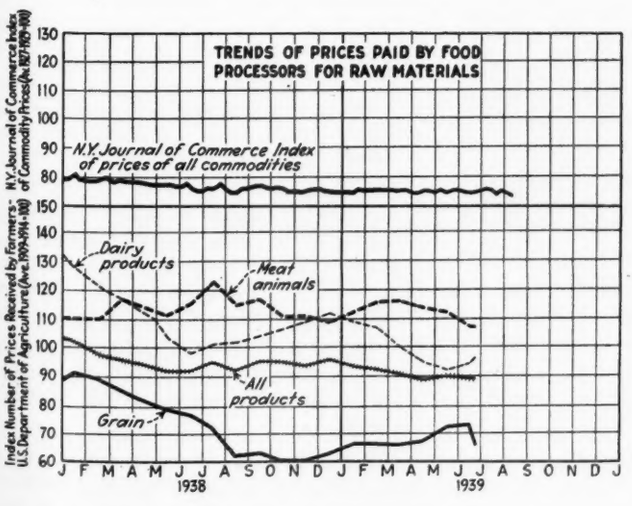
EGGS, CASE EQUIVALENT, in storage August 1, 1939, totaled 11,103,000 cases. The total a year before was 10,278,000 cases and the 1934–1938 average for the date was 11,620,000 cases.

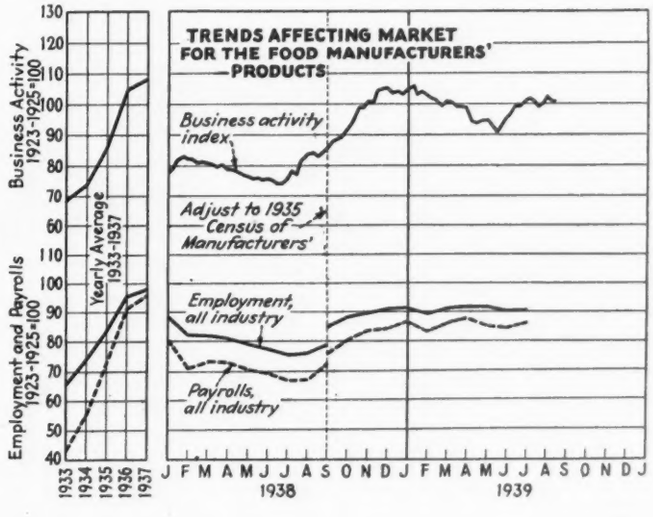
POULTRY, all kinds, in frozen storage on August 1, 1939, was 65,138,000 lb., compared to 52,640,000 lb. on August 1, 1938, and a 1934–1938 average of 51,613,000 lb. for the date.

MEATS, all kinds, in cure and storage on August 1 of this year amounted to 559,289,000 lb., up from the 447,686,000 lb. recorded a year before, but lower than the 572,111,000 lb. average for the date in 1934–1938.

LARD in storage on August 1, 1939, was 139,941,000 lb., compared to 123,677,000 lb. on August 1, 1938, and to an August 1 average of 135,119,000 lb. in 1934–1938.

WEEKLY FOOD INDEX of Dun & Bradstreet, Inc., stood at $2.13 on August 15, compared to $2.41 a year before.


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
N.Y. Journal of Commerce Index of prices of all commodities
Dairy products
Meat animals
All products
Grain
Index Number of Prices Received by Farmers-U.S. Department of Agriculture (Ave. 1909-1914=100)
N.Y. Journal of Commerce Index of Commodity Prices (Av. 1927-29=100)
J F M A M J J A S O N D J F M A M J J A S O N D J
1938
1939


Business Activity 1923-1925=100
Employment and Payrolls 1923-1925=100
Yearly Average 1933-1937
1933
1934
1935
1936
1937
TRENDS AFFECTING MARKET FOR THE FOOD MANUFACTURERS' PRODUCTS
Business activity index
Adjust to 1935 Census of Manufacturers'
Employment, all industry
Payrolls, all industry
J F M A M J J A S O N D J F M A M J J A S O N D J
1938
1939

Men, Jobs & Companies

INDUSTRY

Abbotts Dairies, Inc., Philadelphia, will construct a $100,000 dairy products plant at Coudersport, Pa.

Anheuser-Busch, Inc., St. Louis, will spend $750,000 to build a new five-story fermenting "cellar" with a capacity of 50,000 bbl.

E. J. Brach & Sons is erecting at Chicago a $500,000 addition to its confectionery plant. The building will cost $300,000 and another $200,000 is to be spent for equipment.

Buckeye Cotton Oil Co. has started construction of soybean storage bins and dryer to cost $55,000. Next year the company will spend $350,000 to erect a solvent plant.

Central Soya Co., Inc., and **McMillen Feed Mills, Inc.,** both of Fort Wayne and Decatur, Ind., have awarded contracts for the construction of a 1,000,000-bu. elevator, an expeller-type soybean processing plant and a feed mill at Gibson City, Ill.

Clark's Bakery, Inc., Columbus, Ohio, is spending $75,000 to increase its production capacity and improve its distribution service. New plant equipment and new trucks are being purchased.

Clinton (Ia.) **Co.** has let a contract for the construction of a modern power plant to cost about $900,000.

Continental Baking Co. is building an addition which will substantially increase its Richmond, Va., plant capacity.

Crampton Canneries, Inc., has remodeled its Plain City, Ohio, plant so it will handle 50,000 tons of corn and 40,000 tons of tomatoes.

Peter Eckrich & Sons, Inc., Fort Wayne, Ind., will expand its meat packing plant at a cost of $40,000.

The F. & F. Soup Co. is enlarging its plant at Plantsville, Conn., and installing new equipment. The capacity will be stepped up from 1,000 to 10,000 cans daily.

Geneva (Ohio) **Winery** is increasing its capacity to 100,000 gal. by the installation of new tanks and equipment.

Gorton-Pew Fisheries Co., Gloucester, Mass., will establish a new plant at Caraquet, N. B., where it will freeze fish.

CLARENCE E. ELDRIDGE

For eight years in charge of the General Foods advertising accounts with Young & Rubicam, of which he was vice-president, Mr. Eldridge has been named vice-president of General Foods Sales Co., New York, in charge of merchandising cereal products.

Hales & Hunter Co., Chicago, suffered damage estimated at $100,000 from a fire which occurred in the plant on Aug. 4.

Edward Hahn Packing Co., Johnstown, Pa., will build a large addition to its plant.

H. J. Heinz Co., Pittsburgh, plans the construction of $150,000 plant at Wallaceburg, Ont.

Kelly Bros. & Hood River (Ore.) **Apple Growers Association** suffered a loss of $250,000 from a fire which destroyed their plants recently.

LaRosa & Sons, Inc., will erect a $250,000 macaroni manufacturing plant at Danielson, Conn.

Louisiana State Rice Milling Co. is erecting a $50,000 elevator at its Lake Charles, La., mill. The elevator will have a capacity of 50,000 bbl.

Newton, Robertson & Co. has started construction of a $70,000 baking plant at Hartford, Conn.

Omar Bakery, Milwaukee, is erecting a $90,000 combination truck storage and repair shop.

Pillsbury Flour Mills Co. will spend $300,000 to remodel its flour warehouse at Buffalo. The warehouse will be rearranged and new flour handling equipment installed.

Polk Co., Haines City, Fla., has completed plans for a citrus canning plant at Tampa, to cost $65,000.

Robin Hood Milling Co. will build a $1,000,000 plant at Port Colborne, Ont., for the manufacture of cereals.

Soy Bean Processing Co. will erect a 100x106x45-ft. plant at Waterloo, Ia.

Steinhagen Rice Milling Co. and **Comet Rice Co.,** Galveston, Tex., have merged under the name of **Comet Rice Mills.**

Streitmann Biscuit Co. has purchased a 15-acre site in Mariemont, a Cincinnati suburb, and will erect a bakery costing $2,000,000.

PERSONNEL

Dr. F. C. Blanck, chief of food research, Bureau of Chemistry and Soils, U. S. Department of Agriculture, has resigned to join the technical staff of H. J. Heinz Co. He will be primarily concerned with new developments in food technology and new prepared foods.

George A. Casey has resigned as vice-president and general manager of Wilmington (Del.) Provision Co. to become president of John J. Felin & Co., Philadelphia. J. E. Murphy, president of Felin, becomes chairman of the board.

H. E. Conrad is executive director of the new Cultivated Mushroom Institute of America, Inc., New York. The Institute was formed by nine mushroom growers and canners from all parts of the country.

Lewis A. Cushman, Jr., president of Purity Bakeries Corp., Chicago, has been elected president of all the subsidiary companies of Purity Bakeries Corp.

C. Bruce Flick, formerly assistant treasurer of Hawaiian Pineapple Co., Ltd., San Francisco, has been made advertising manager. Kenneth F. Boucher becomes merchandising service manager.

Ted Folk is now manager of the Phelps County Creamery & Produce Co., Holdredge, Neb., succeeding C. M. McCoy, resigned.

Frank K. Foss, of the beef department of Wilson & Co., Chicago, was made a

vice-president of the company on July 28 to succeed the late W. J. Cawley.

Harry S. Helm has been advanced from president to chairman of Russell-Miller Milling Co., Minneapolis. **Charles G. Ireys** moves up from vice-president to president. **Leslie F. Miller,** vice-president in charge of sales on the West Coast, becomes treasurer. M. F. Mulroy, vice-president in charge of the company's mill at Buffalo, is the new general manager.

William R. Hemrich has resigned as advertising manager of Armour & Co., Chicago, to go with Sherman K. Ellis & Co., Inc., an advertising agency. He is succeeded at Armour by James E. Weber, previously assistant manager of the advertising department.

J. Edgar Jennings has been made vice-president in charge of plants by Walter H. Hildick Co., Inc., New York. Mr. Jennings has been engaged in the manufacture of apple beverages and other apple products for 20 years.

Paul H. Jordan, Lincoln, Neb., has been appointed assistant director of the Federal Surplus Commodities Corporation to handle the food stamp program in the Middle West. His headquarters are at Milwaukee.

Albert I. Kegan, formerly with the Food and Drug Administration and the chemistry faculty of Armour Institute of Technology, has opened an office in Chicago as a consulting chemist.

Don G. Mitchell is now sales manager of Pepsi-Cola Co., Long Island City, N. Y. He formerly was chief of the marketing division of American Can Co.

James Smith, IV, has been elected a director of G. Krueger Brewing Co., Newark, N. J., to succeed Clark W. Tobin, resigned.

Maurice Sommers has resigned as vice-president of Paul Schulze Baking Co., Chicago. He had been with the company ten years.

Herman Steen, secretary of Millers National Federation, Chicago, has been made vice-president of the Federation also.

Adolphe E. Stender resigned recently as manager of the Marathon Cooperative Dairy Association, Wausau, Wis., to become manager of the Lincoln Non-Stock Cooperative Milk Producers Association plant at Havelock, Neb.

C. M. Tysinger has been named manager of the Roanoke, Va., plant of Southern Dairies, a subsidiary of National Dairy Products Corp.

W. H. Vanderploeg has been elected executive vice-president and general manager of Kellogg Co., Battle Creek, Mich.

Carl Whiteman has resigned, effective Oct. 1, as vice-president of General Foods Corp. and General Foods Sales Co,. Inc., New York. Mr. Whiteman will form his own organization to specialize in the merchandising of grocery store products.

DEATHS

Otto S. Busch, 68, a member of the St. Louis brewing family and a nephew of Adolphus Busch, founder of the brewing company, at Hollywood, Calif., July 27. He had been retired from the brewing business for ten years.

S. G. Chequelin, 66, sugar technologist prominent in Louisiana and the Tropics, recently. He formerly was general manager and superintendent of the Columbia Sugar Corp., Cartegena, Colombia.

Herbert M. DeGolier, 53, president of Deerfield Creamery Co., at Madison, Wis., July 22.

Paul S. Harmon, 50, managing director of the Simmons & Hammond division of General Ice Cream Corp., at Portland, Me., July 31.

Charles W. Honegger, 57, vice-president and general sales manager of American Packing Co., St. Louis, July 31, at Los Angeles.

Hugo A. Koehler, 70, former chairman of the Columbia Brewing Co., St. Louis, Aug. 2.

Dr. John R. Manning, 42, chief of the technological section of the Bureau of Fisheries, Aug. 4. He supervised scientific studies of the utilization and preservation of fishery products.

WALTER S. MACK, JR.

He has been elected president of Pepsi-Cola Co., Long Island City, N. Y. Mr. Mack is chairman of Loft. Inc., which owns a controlling interest in Pepsi-Cola. At a stockholders' meeting, he reported that Pepsi-Cola had about 400 franchise bottlers in the United States, 100 in Canada and 60 in other countries.

William A. Morrill, 65, owner of the L. J. Foss Candy Co., Cambridge, Mass., Aug. 12.

Henry D. Muller, 82, for 35 years treasurer of V. Loewer's Gambrinus Brewing Co., New York, Aug. 2.

John C. Noack, 62, proprietor of the Noack Bakery, San Antonio, Tex., recently.

Aime Normand, founder of Normand Bros. Bakery, Manchester, N. H., Aug. 2.

Ernest T. Rogers, 42, president of British Columbia Sugar Refining Co., Vancouver, recently.

William Setzer, 49, president of the Cheyenne (Wyo.) Poultry Co., recently.

J. Henry Shuman, 48, president of Goodwin-Shuman Candy Co., Johnstown, Pa., July 19.

Wallace C. Watkins, 56, general manager of the Swift & Co. properties in Australia, July 17, in Sydney.

Stephen B. Willcutts, 56, co-manager of Kuhner Packing Co., Fort Wayne, Ind., July 29.

ASSOCIATED INDUSTRIES

Associated Factory Mutual Fire Insurance Cos. has opened new district offices in New York and Charlotte, N. C. W. D. Bullard heads the New York staff and J. K. Griffin, the Charlotte office.

Baker Ice Machine Co., Omaha, reports the death of Frederick E. Hartmann, general sales manager, who was with the company for 33 years.

Fritzsche Bros., Inc., New York, reports the death of Michael B. Zimmer, Chicago representative, at the age of 70.

General Electric Co., Schenectady, N. Y., has appointed G. R. Prout, manager of sales of industrial control and W. T Darcy manager of sales of renewal parts.

Joe Lowe Corp. is opening a branch plant at Chicago for the manufacture of its line of candy, ice cream and bakery supplies.

S. B. Penick & Co., New York, is making arrangements for world-wide distribution of a new vitamin A concentrate developed by Biochemical Products Corp., Evanston, Ill. Concentrations from 1,000,000 to 2,500,000 units of vitamin A per gram is possible commercially, it is reported. The concentrate is said to be clear and free of undesirable odors and flavors.

Productive Equipment Co., Chicago, has appointed Western Machinery Co., Sacramento, Calif., as agent for the sale of its vibrating screens in Western and Pacific Coast States.

Just off the Press

BOOKLETS • LITERATURE • BULLETINS

Food Plant Equipment

AIR CONDITIONING—"The Story of Air Conditioning" published by Bureau of Information, Air Conditioning Manufacturers' Assn., Southern Bldg., Washington, D. C., tells the story of air conditioning in controlling the four factors in air: temperature, humidity, air movement, and cleanliness.

AIR CONDITIONING EQUIPMENT—Pittsburgh Lectrodryer Corp., Pittsburgh, Pa., has issued the following reprints: "Air Conditioning Helps Smash the Atom", "Adsorption Dehumidification" by G. L. Simpson, and "The Activated Alumina System as Applied to Air-Conditioning and Drying Problems" by G. L. Simpson; Bulletin BC on typical uses of the activated alumina system for drying air, other gases, and certain liquids; and a folder on "Air Conditioning Industrial Dehumidification".

AGITATORS AND MIXERS—More than 100 agitators and mixers for processing foods are illustrated in 96-page Catalog No. 395 by The Patterson Foundry & Machine Co., East Liverpool, Ohio.

MATERIAL HANDLING EQUIPMENT—Information on a complete line of chains, speed reducers and types of material handling equipment is presented in 960-page illustrated General Catalog No. 87, by The Jeffrey Manufacturing Co., Columbus, Ohio.

MIXER—Safety features and variable speeds of air motored agitators, direct and gear driven, are discussed in a recent folder by Eclipse Air Brush, Inc., Pneumix Division, 398 Park Ave., Newark, N. J.

MIXERS—Catalog B-66 of Mixing Equipment Co., Inc., 1088 Garson Ave., Rochester, N. Y., gives specifications, engineering details and illustrations of side-entering mixers for agitating contents of tanks holding 5,000,000 or more gallons of thin fluids.

PROCESSING EQUIPMENT — Recent bulletins of Frick Co., Waynesboro, Pa., include: Bulletin No. 234-B on evaporative condensers for ammonia and Freon-12 refrigerating systems with capacity ranges from 5 tons refrigeration to 138 tons; and Bulletin No. 78 on steel peanut pickers for separating peanuts from the vine.

SCALDER — "The Haynie Tomato Scalder" claimed to require a minimum amount of water, steam and power for operation, is discussed in a recent folder by A. K. Robins & Co., Inc., Lombard and Concord Sts., Baltimore, Md.

Plant Accessories and Supplies

CHAINS AND SPROCKETS—Baldwin-Duckworth Chain Corp., Springfield, Mass., has published 120-page, leather bound, indexed Catalog M, dealing with chains and sprockets for power transmission, conveying and elevating.

CLEANING UNITS—Stationary vacuum cleaning units, consisting of a motor operated vacuum pump, separator, and piping system leading to vacuum inlets, are described and illustrated in Bulletin No. 120-FI, by The Spencer Turbine Co., Hartford, Conn.

COMPRESSORS — "ES" compressors, built in sizes from 10 to 125 hp. and 5 to 2,500 lb. pressure, designed to run at moderate speeds on heavy continuous service, are described in 28-page Form 3063-A, by Ingersoll-Rand Co., 11 Broadway, New York, N. Y.

DIESEL ELECTRIC GENERATORS — "Caterpillar" diesel electric generator sets, available in nine sizes, are illustrated in actual operation in sugar mills, dairies, creameries and other industrial plants, in Form 4658, by Caterpillar Tractor Co., Peoria, Ill.

ELECTRIC MOTORS—Bulletin 251-A, published by Crocker-Wheeler Electric Manufacturing Co., Ampere, N. J., deals with "Polyspeed" alternating-current, adjustable speed motors and their various industrial applications.

FIRE OBSERVER—The Detroit fire observer for inspection of fuel bed, furnace walls and boiler tubes without admitting cold air into the furnace, is described and illustrated in Bulletin No. 513 by Detroit Stoker Co., General Motors Bldg., Detroit, Mich.

PUMPS, ENGINES, COMPRESSORS—Worthington Pump and Machinery Corp., Harrison, N. J., has published the following: Bulletin L-611-B8 on feather valve, single-cylinder, single-stage motor and steam driven compressors, Types HB and HS; Bulletin W-321-M3A on deepwell pumps for water supply systems; Bulletin S-500-B5E on Type B direct-injection, vertical four-cycle, diesel engines; Bulletin C-1100-B2 on single-stage and two-stage, belt-driven or direct-connected to synchronous motor, horizontal duplex type, refrigeration compressors; Bulletin S-500-B36 on Type CC, direct-injection, totally enclosed, vertical four-cycle, diesel engines; and Bulletin W-321-B13 on Types DY, DEY, DHY, DKY, DXY and DEXY turbine drive, monobloc, centrifugal pumps.

REFLECTORS—Eight features of "Reflecto-Duct" reflector for fluorescent lighting are listed in illustrated Form 5139 by Reflectors, Inc., 3225 Frankford Ave., Philadelphia, Pa.

SEPARATORS—Bulletin 97, dealing with spout type magnetic separators made by Stearns Magnetic Mfg. Co., Milwaukee, Wis., features the safety trap for protection against failure and other operating conditions.

SHEAVES—Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has issued Bulletin No. 1261-B, entitled "Vari-Pitch Texrope Sheaves", illustrating two types of drives for changes of speed: stationary and motion control.

WATER CONDITIONING EQUIPMENT—The Permutit Co., 330 W. 42nd St.,

New York, N. Y., has published the following: Bulletin No. 2217 on expansible strainer head for filter and softener pipe underdrain systems; Bulletin No. 2204 on the Spaulding precipitator for softening water by cold lime treatment; and "Removal of Iron and Hardness from Water", reprint of a paper by Mr. D. J. Saunders before the New England Water Works Assn.

WATER SOFTENERS—Recent publications of The Permutit Co., 330 W. 42nd St., New York, N. Y., include: Bulletin No. 597, "Permutit Zeolite Water Softening," describing the Zeolite method for removing hardness from a water supply; and Bulletin No. 2215, "Permutit Portable Water Softeners."

WATER SOFTENERS—Four types of Zeolite water softeners with the particular advantages and applications of each are discussed in Bulletin No. 602 by Elgin Softener Corp., Elgin, Ill.

Packaging

SHIPPING CONTAINERS — "Steelstrap" and unit-load processes for the elimination of unnecessary shipping expense, damage and loss of time, are the subject of Form AD9, "Stopping Profit Leaks Beyond the Production Line"; and the unit-load process and equipment for bracing carload freight uniform and mixed ladings are discussed in Form AD7 by Acme Steel Co., Chicago, Ill.

WRAPPING MACHINES—A folder giving general information on wrapping machines and organizations using them has been issued by Package Machinery Co., Springfield, Mass.

WRAPPING MACHINE—Model CM-2 for wrapping small packages at the rate of 250 or more per minute is the subject of a recent bulletin issued by Package Machinery Co., Springfield, Mass.

Trucks, Tractors & Accessories

COMMERCIAL CARS—Marmon-Herrington Co., Inc., Indianapolis, Ind., has issued Form No. 390125-1 on the all-wheel-drive Ford V-8 passenger and commercial cars.

STEEL TRUCK BODY—The Lindsay all-steel truck body combining steel sheets and framing is announced in a folder by Articulair Corp., Transport Division, 481 Beaufait, Detroit, Mich.

TRAILER—"Aerovan", trailer with airplane type construction, designed to cut haulage costs in four ways, is announced in a recent bulletin by Fruehauf Trailers, Indianapolis, Ind.

TRACTOR—The "Caterpillar" D7 diesel tractor built for heavy duty tractor service is described with illustrations in 32-page catalog with special emphasis on engine, fuel system, and final drive, by Caterpillar Tractor Co., Peoria, Ill.

Miscellaneous

ESSENTIAL OILS—Fritzsche Bros., Inc., 76th Ninth Ave. at 15th St., New York, N. Y., has published its August, 1939, 28-page wholesale pricelist of essential oils, aromatic chemicals and allied products.

MERCHANDISING AID—"Ways to Sell More Canned Grapefruit and Grapefruit Juice", issued by American Can Co., 230 Park Ave., New York, N. Y., featuring recipes and photographs for display-building purposes is one of a series of publications designed to aid retailers in selling more canned foods.

Maybe you don't know it—but—you are using from fifteen to fifty per cent

TOO MUCH FUEL

. . . that is, if you're baking bread . . . if you are roasting nuts or cocoa . . . if you are cooking hard candies—in general if you employ high temperatures in your processes. ★ The Kemp Industrial Carburetor, which premixes gas and air for complete combustion will correct this condition for you. And, for good measure, Kemp gives you automatic control, laboratory accuracy and wider turn-down range. ★ Our resident engineer in your section will be glad to show you just how these general statements will apply to your specific problem . . . to tell you whether you can save fifteen per cent of your fuel, or fifty per cent, or something in between. Tear out this ad *now*, and have your secretary write **The C. M. Kemp Manufacturing Co., 405 E. Oliver Street, Baltimore, Maryland.**

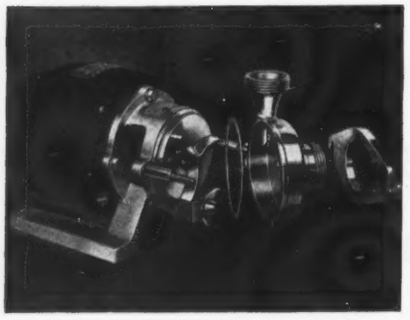
KEMP of BALTIMORE

Food Equipment News

REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES

Centrifugal Milk Pump

THE CREAMERY PACKAGE MFG. Co., 1243 W. Washington Blvd., Chicago, Ill., is making a new "Roto-Seal" centrifugal milk pump. This unit consists of a pump case and plate, impeller and rotary seal. No stuffing box is needed. The pump can be assembled or disassembled in 30 seconds without tools and is made of polished metal suitable for the handling of milk, cream and liquid food products. Drive is direct from a close coupled motor of $\frac{1}{4}$-hp. The pump is equipped with $1\frac{1}{2}$-in. suction and discharge line and, it is claimed, will deliver 16,000 lb. of milk per hour at 5 ft. head or 10,000 lb. at $12\frac{1}{2}$ ft. head. The floor space required for this pump is $11\frac{3}{8} \times 7$ in.

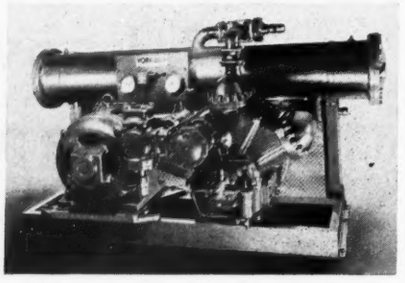


Sanitary centrifugal milk pump

Refrigeration Compressor

YORK ICE MACHINERY CORP., York, Pa., has brought out a new design of W-type compressor for refrigeration and air-conditioning applications. This equipment is said to reduce both the operating expense and the space requirements per ton of refrigeration. It has a one-piece casting which forms the crankcase of the compressor and houses the removable, nickel-iron cylinder sleeves which are assembled in three pairs. One pair of cylinders is set vertically and the other two are on either side at an angle of 60 deg. to the vertical. This arrangement is said to provide balance, to simplify lubrication and accessibility, and to permit the use of a short, rigid, double-throw crankshaft requiring only two main bearings and remaining in permanent alignment. Another advantage claimed for this compressor is that it can be operated from standard motors of many suitable current characteristics.

These compressors are available in units from 40 to 175 hp. and can be used with water-cooled condensers or with evaporative condensers.



W-Type refrigeration compressor

Small Lift Truck

CLARKE EQUIPMENT Co., Tructractor Div., Battle Creek, Mich., has developed a small-sized lift truck suitable for general service in canneries and warehouses. This machine is 38 in. wide and has a 38-in. wheelbase, permitting easy maneuverability in narrow warehouse aisles. The lift is 60 in. and speed is from 1 to 7 m.p.h. This lift truck requires 2 in. underclearance on skid platforms or pallets, much less than the 7 in. or more required by standard size lift trucks.

Small-sized lift truck for warehouses and canneries

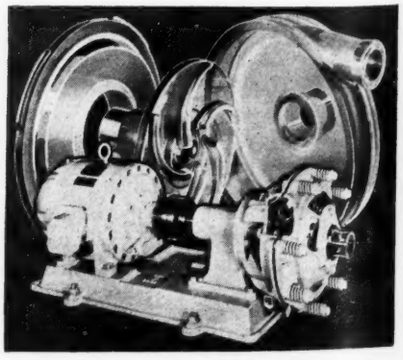
Control Valve

E. C. ATKINS & Co., 402 S. Illinois St., Indianapolis, Ind., has designed the "Ackomatic" valve, an electrically operated valve for use in automatic controls, automatic timing devices and temperature controls.

Line pressure is the actuating force for this valve. Closing speed can be varied to suit the requirements of the application. It is designed to provide full flow on pipelines from $\frac{3}{8}$ in. to 3 in. and for pressures up to 300 lb. The design embodies no weights, levers, or packing, operation being by means of an electrical coil.

Glass Pumps for Food Products

NASH ENGINEERING Co., South Norwalk, Conn., in cooperation with Corning Glass Works, Corning, N. Y., is manufacturing a sanitary pump made entirely from glass for food products. The material used in constructing this pump is the "Pyrex" heat and shock-resisting glass which can be used at temperatures up to 150 deg. F. in standard design, or to 200 deg. F. in special design. This material will not affect or contaminate food products in any way. In addition, as the pump is fully transparent, the interior of the pump can be seen at all times, which is a great aid in maintaining cleanliness. In cleaning, it is possible to lay open the whole interior of the pump, so that a thorough job can be done. As a safety factor, the pump is provided



Glass pump for handling food products

with an automatic release which prevents interior pressure from building up to a point where there would be danger of fracture of the glass material.

Fluorophotometer

FOR THE DETERMINATION of the vitamin B_1 and vitamin B_2 content of various materials, Pfaltz & Bauer, Inc., Empire State Building, New York, N. Y., has developed the photoelectric fluorophotometer, Model A. This instrument is particularly designed for measuring the fluorescence of liquids and solutions, and is also used in colorimetry and in the measurement of turbidity. It has found application in the dairy, cereal, baking, yeast and other food industries.

Unit Oven for Bakeries

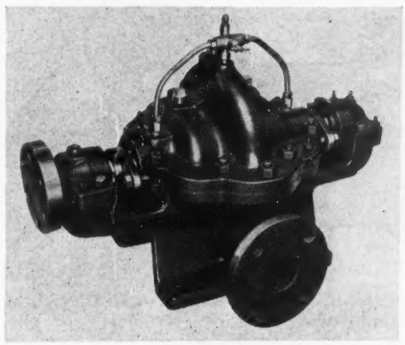
STEINER-IVES Co., Bloomfield, N. J., is making the "Zephyr" bakery oven, for use by small bakers, restaurants and other institutions. This oven is designed for use as a single unit or grouped in multiples of this unit. Each oven is 50 in. wide, 72 in. deep and 78 in. high. The unit contains two separate baking compartments, each separately fired, and can be heated by either gas or electricity. Control of the heat in these compartments is independent and automatic. This makes possible the baking of two different types of product at the same time in each unit.

Heating of the "Zephyr" oven is entirely indirect, so that products of combustion cannot come in contact with the products. Temperature of the oven can be raised or lowered about 100 deg. F. in 15 minutes, thus providing flexibility of heat control and making the oven adaptable to the production of a wide variety of goods without loss of time. Control of heat is by means of a series of heat diverters under the hearth, by means of which the heat may be diverted to the hearth, then equalized on top and bottom and finally diverted to the top. A single unit has 28 sq. ft. of baking hearth surface which is a capacity of 8 bun pans, each 18x26 in. Each baking chamber (of which there are two per unit) is 37 in. wide, 54 in. deep and 12 in. high, giving a hearth surface of 14 sq. ft. and a cubicle content of 14 cu. ft.

Unit oven for small bakeries

Ball-Bearing Pump

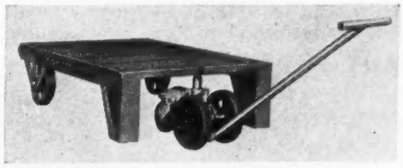
ALLIS-CHALMERS MANUFACTURING Co., Milwaukee, Wis., is including ball bearings as standard equipment in nearly all its various types of single-stage centrifugal pumps.



One of the new Allis-Chalmers line of ball-bearing centrifugal pumps.

Skid Jack Combination

SERVICE CASTER & TRUCK Co., Albion, Mich., has developed a skid jack combination consisting of a semi-live skid with wheels at one end and rigid legs at the other, and a wheeled jack or lifting unit. This unit combines three phases of material-handling—skid storage, lift truck and floor truck operation.

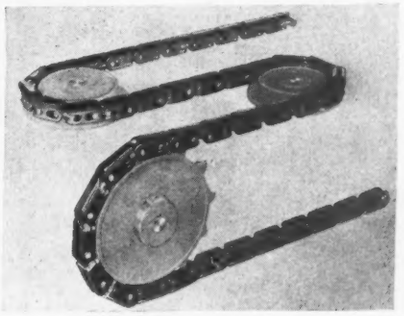


Skid-jack combination for factory Trucking.

In use, the jack is pushed forward until the lifting stud is directly under a socket in the skid. When pressure is applied to the handle the lifting stud raises upward, bringing the rigid skid legs off of the floor and making a wheeled unit of the combination. When the handle reaches its lowest point the union between the jack and skid is automatically locked and the load is free to move on wheels. Lowering of the load is accomplished by means of a foot pedal release. Capacities are from 1,200 to 5,000 lb., and wheel sizes are available from 7 to 12 in. in diameter.

Chain Flexes Four Ways

STANDARD CONVEYOR Co., North St. Paul, Minn., has brought out the "Four-Flex" conveyor chain in hardened steel. This chain has been developed particularly for use in such food plants as dairies, breweries, ice cream plants, distilleries and canneries, where the material provides for long life under severe operating conditions. As shown in the illustration, this chain is flexible so that it will smoothly pass around sprockets or idlers and can be bent in any one of four planes.



Conveyor chain that bends four ways.

Variable Speed Transmission

IDEAL COMMUTATOR DRESSER Co., Sycamore, Ill., is making the "Select-O-Speed" variable speed transmission in sizes up to 7½ hp. This transmission gives infinite speed selection over a 5 to 1 ratio, and higher ratios can be obtained if desired. It is installed between the motor and the driven machine, being connected to both by means of V-belts. The transmission can be installed for either vertical or horizontal drive. Speed is changed by the simple movement of a control lift lever, and can be accomplished while the machine is in operation.

Rubber Filtering Materials

UNITED STATES RUBBER Co., 1790 Broadway, New York, N. Y., has recently developed two rubber products useful in the filtration of food materials. One of these is called "Multipore" and consists of a porous rubber sheet made from latex rubber. This sheet is provided with minute and uniformly spaced holes extending perpendicularly through it. It is avail-

able with from 1,100 to 6,400 holes per sq. in., hole diameters varying from .012 to .004 in. depending upon the type. This "Multipore" sheet is available in soft rubber, hard rubber, flexible hard rubber, and Neoprene. In its application as a filter, it is used where a cake is built up upon the filter cloth and the filtering then occurs through the cake, the Multipore sheet acting merely as a holder. This use is because the diameter of the holes in the sheet are too large for satisfactory filtration and as in the case of filter cloth, dependence is placed upon the formation of a filter cake either from particles in the material being filtered or from a filter medium.

The second new rubber material is called "Microporous Hard Rubber". It is an ebonite product permeated by continuous interconnecting pores of microscopic and sub-microscopic size. This material is available in two classes: the regular class has four diameters in the range from 0.1 to 0.3 microns; the "Ex" modification has four diameters from 2 to 5 microns, and about 100 times the permeability.

This microporous rubber can be obtained in simple sheets or in sheet reinforced with various types of backing such as textile or woven metal fabrics which serve to reinforce and strengthen the sheet. The grade of microporous hard rubber that is thought to be most suitable for general filtration purposes has a porosity of 65 to 70 per cent and an average pore diameter of 2 to 4 microns. Filter diaphragms made from this sheet with a thickness of 4/100ths of an inch and operated under 25 in. of vacuum have permeabilities represented by the passage of water at rates ranging from 5 to 20 g.p.m. per sq. ft. of diaphragm. It is claimed that tests shows this filter sheet to have a faster speed of filtration than standard cotton and that it will retain fine precipitates without clogging of the pores and with easy removal of the filter cake.

Pressure Reducing Valve

NORTHERN EQUIPMENT CO., Erie, Pa., has a new line of Copes valves for steam and water pressure reducing service. These include: Type DBI, a direct-operated, spring-loaded unit, for pressures from 2 to 50 lb., with regulation from fully closed to wide open of not more than 10 per cent of controlled pressure; Type S-1, direct-operated, spring-loaded unit for controlled pressures from 15 to 250 lb., with regulation from fully-closed to wide open of not more than 10 per cent of the controlled pressure; Type W-DBI, direct-operated, weight-loaded unit is designed for controlled pressure limits from a vacuum of 27 in. to a gage pressure of 10 lb. with regulation from fully-closed to wide open not more than 0.4 lb.; Type WS-1, direct-operated, spring-loaded unit, designed for controlled pressure limits of 10 to 125 lb., with regulation from fully-closed to wide open of not more than 6 lb.

In addition to these valves there are also Types DSLH and 3-SH-2C for high pressures—higher than usually encountered in the food industries.

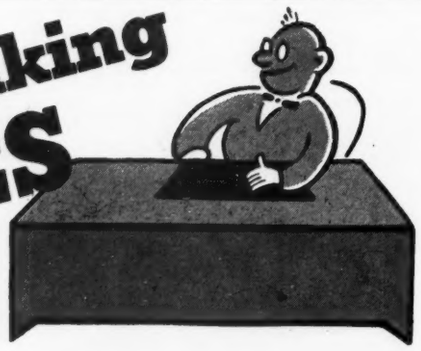
For use where a remote control station is required, master controls have also been developed to go with these valves.

Fruit Juice Deaerator

AMERICAN MACHINERY CORP., Orlando, Fla., has developed the PacRite pulley-type deaerator for removing oxygen and other gases from fruit juices. This deaerator consists of a stainless steel tank equipped with a motor-driven rotor. In this tank the

If you're thinking of SALES

as well as lower packaging costs



We design our machines to give you sales advantages, as well as mechanical efficiency. Our FA type machine is a good example of what this means to package goods manufacturers.

With an FA machine in your plant, you have wide scope to carry out new merchandising ideas with your package . . This machine is easily and quickly adjustable for a wide range of sizes; you can add new items, or change your package size or proportions at will. The FA can be equipped to handle any type of wrapping material—transparent cellulose, glassine, foil, waxed paper, or plain paper wrappers.

Manufacturers find this versatility a valuable sales-help, not only for introducing new products, but also on special occasions. For example, when they combine two standard products in one wrapping at a bargain price; or when they dress up their regular packages in special wrappers for the holiday trade.

ECONOMY AND EFFICIENCY

Of simple design, the FA is low in price, and quickly pays back its cost in savings. Fitted with Electric Eye, the machine handles printed material in roll form, saving up to 20% on the cost of material in cut-to-size sheets. Its high speed and operating efficiency save labor costs.

The FA is but one of our 78 models of wrapping machines—a complete line covering virtually every wrapping requirement in modern industry. Consult our nearest office, or write for literature.

PACKAGE MACHINERY COMPANY

SPRINGFIELD, MASSACHUSETTS

New York Cleveland Chicago Los Angeles

Peterborough, England: Baker Perkins, Ltd.

Mexico, D. F., Apartado 2303

Melbourne, Australia: Baker Perkins Pty., Ltd.

Buenos Aires, Argentina: David H. Orton, Maipu 231

Model FA popular carton wrapping machine used in many different industries and a few of the well-known packages it wraps.

PACKAGE MACHINERY COMPANY

Over a Quarter Billion Packages per day are wrapped on our Machines

juice is subjected to a vacuum of approximately 29½ in., developed by means of a two-stage steam jet evactor, or by a rotary vacuum pump, as desired to suit the installation. All parts of the equipment coming in contact with the juice are stainless steel. The tank top is removable for inspection and cleaning purposes and all lines and parts handling juice are of the sanitary type for easy disassembling and cleaning. This deaerator is made in capacities from 200 gallons up. When it is to be used on juices that are not corrosive, cheaper metals can be substituted for stainless steel, if desired.

Tank Heater

LEE METAL PRODUCTS Co., Philipsburg, Pa., has developed the "Nocoil" tank heater to take the place of coils in the heating of fruit juices and other food products where stainless steel is an advantage over plain copper or tinned copper tubing. In this heater, the top consists of a ring of seamless stainless steel tubing perforated on the bottom for even steam distribution. A flat ring of stainless steel forms the bottom, and both top ring and bottom ring are connected inside and out by corrugated cylinders of stainless steel. A stainless steel inlet tube passing between the corrugated walls carries steam into the top ring where it is evenly distributed through the perforations into the steam chamber. The bottom has a 2-in. pitch for drainage to the outlet. On the inside of both cylinders are several drip rings which collect condensation as soon as formed, allowing it to drop directly to the bottom instead of running down the corrugations and thus insulating them from direct contact with the steam. As a result, there is no tendency for parts of the heating surfaces to become overheated, but the heat is uniform all over the heating surface.

This heating unit can be installed in any type of tank and is available in sizes from 5 to 64 sq.ft. of surface, suitable for tanks from 100 to 1,000 gal. capacity.

Vacuum or Air Pressure Pumps

NEW JERSEY MACHINE CORPORATION, 1505 Willow Ave., Hoboken, N. J., is making the "Motoair," a pump for providing a constant vacuum or pressure without pulsation or vibration. This unit has the motor and pump in one integral casing and requires no belt, gears, pulleys or other driving devices. It can be mounted on the floor, or on the wall, or on the ceiling, as desired. It is available in ¼ to 1-hp. units for pressures up to 30 lb., and for capacities of 2½ to 10 cu.ft. of air per minute in intermittent service on pressure only. In continuous service on vacuum or pressure it is available in sizes from ¼ to 2 hp., and in capacities from 5 to 70 cu.ft. of air per minute.

Hand Washing Equipment

LION METAL PRODUCTS, INC., Aurora, Ill., has developed the "Showerway", a device for providing facilities anywhere for washing hands with warm, showering water and soap. In operation, the user releases the water and soap by means of a foot pedal. Water is held in a 6-gal. stainless steel tank above the showerhead and is released by gravity. There being no pressure besides gravity behind the water, it is stated that a thorough hand-washing can be obtained with from 6 to 8 oz. of water. The water is heated in the unit by electricity. This device is for installation in food plants.

IT'S THE FREE FLOATING DRIVE SHAFT THAT KEEPS YOUR STERLING PUMP TROUBLE FREE!
Note: NO RIGID SPIDERS
PUT a magnifying glass over the picture of that Sterling drive shaft. You'll see it is "free floating"—free to seek and follow its own best running position, free from strains upon the drive shaft bearings, free from the interference of bands and crooks! Because no attempt is made to center drive shaft in discharge column!
In addition, Sterling discharge columns, shaft enclosing tubes, and shafting as well as couplings are machine-cut threaded to insure a tight fit (no possible chance for water to contact threads) and the entire pump has the advantage of precision assembly!
Sterling gives service from coast to coast! Write us today!
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STERLING
DEEP WELL TURBINE PUMPS
WRITE FOR CATALOG TODAY!
Sterling
DEEP WELL TURBINE PUMPS
There are also Sterling Vertical Centrifugal Pumps, Sterling Sump Pumps, Sterling Propeller and Mixed Flow Pumps, and Sterling Jet Pumps—Precision Built—Yet Cost No More!

Quality Control

(*Continued from page* 485)

our St. Louis or Cincinnati plants, samples of the green coffee are sent to our coffee testing room at Cincinnati where they are roasted and cup-tested again to see that the blending orders as made up are correct and also to check the cup-testing of our New York buying office.

Roasting samples are then prepared which go to each roaster as his standard for the particular lot of coffee in question. After the lots have been roasted, a sample is selected from each lot and again cup-tested at the Cincinnati testing room to see that the roaster has complied with the requirements as laid out. Following this, samples are furnished the Kroger Food Foundation for further testing along with samples of competitive coffees which we pick up from time to time, and our previous reports of the New York buying office and the Cincinnati coffee testing room are checked.

Formerly, we had roasting plants at five different locations, namely; St. Louis, Chicago, Detroit, Columbus, and Cincinnati, and we had all preparations made for a sixth installation at Cleveland. These operations have now been reduced to two and we are securing far better control with uniformity of quality at the two plants than we did when we had five. Merely as a matter of curiosity the other day, we selected a large number of coffees, including some of our own, which we knew had been roasted in a single plant, and we compared these with a number of coffees which we knew had been roasted in several different plants. The variation between plants was surprising.

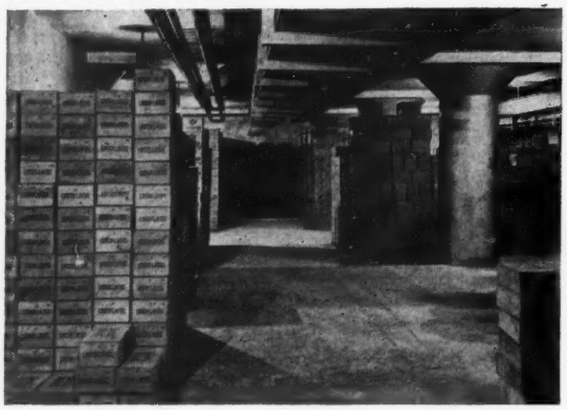
In our efforts to secure uniformity of product and the best quality of roast, we have made a number of changes as compared to our previous practice. All of our roasting equipment is less than ten years old and is maintained at the present time in excellent condition. Approximately half of the equipment is of the very latest type on the market and the other half is the next older style roasting equipment, but, with certain modifications in its use, we are still able to maintain excellent quality from the machines.

Instead of filling these roasters to capacity, as is often the practice, we found that by reducing this capacity we increased the speed of the roasting and avoided the trouble technically known as "tipping". In addition to giving the roaster a sample of color to be maintained on each batch, we have placed special day-light type electric lights at each roaster so that the roaster views his samples under the same light, day or night, under all conditions of outside weather.

Then we placed temperature controls on the roasters so that as soon as the temperature of the batch reached a certain mark, red lights light up so that the attendant can give his personal attention to that batch and finish it with close inspection. Originally, the machines were set up with a single red light. Then we found that where a bulb burned out, we received no indication, so now the machines carry two red lights.

In order to insure uniformity between the two plants at Cincinnati and St. Louis, after the roasts have been sent in to the Cincinnati coffee testing room, we pulverize a series of samples and then flatten them with a spatula beneath a day-light lamp and can judge by the gradation of color whether or not uniformity has been secured. We exchange operators between the two

Economical Control of LOW TEMPERATURE



COLD STORAGE

This modern cold storage room, insulated with Mundet Corkboard, maintains the constant temperatures required for safe storage of perishables.

MUNDET CORK INSULATION conserves refrigeration and permits precise temperature control. In cold storage rooms, in refrigerated cars and trucks, in ships and terminals, Mundet Cork Insulation helps to safeguard perishables in any climate or season. Because it is pure cork, Mundet Insulation offers a natural, dependable barrier to heat infiltration. Fabricated by the most improved methods into Corkboard and Cork Pipe Covering, Mundet Insulation is guaranteed to meet service requirements. It is readily adaptable to individual needs, regardless of the size of the plant. Mundet offices in principal cities offer prompt service. Ask for suggestions and estimates covering the application of Mundet Cork Insulation to your specific needs. Address Mundet Cork Corporation, Insulation Division, 65 S. Eleventh Street, Brooklyn, N. Y.

● *PREVENT VIBRATION TROUBLES by specifying Mundet Natural Cork Isolation for fan foundations and motor mounts. Description sent promptly.*

MUNDET CORK INSULATION

plants for instruction purposes. This has been going on long enough now so that our personnel has been trained to the point that even our coffee experts are surprised at the uniformity between roasts and between the two plants.

Having secured the best possible product leaving the roasting plants, we next endeavored to see that the coffees reached the customer in the same condition. We schedule the coffee from the roasting plants to each one of our branch warehouses. For instance, Detroit gets their coffee from the Cincinnati roasting plant on the same days of the week every week. We then dated the bags so that if the coffee remained in the stores after a certain date, it would be withdrawn from sale. This not only put the store personnel on their toes to turn the coffee over rapidly, but it enabled the customers to police our operations.

Dr. Prescott published, in 1927, some excellent data on coffee staling. This was followed in 1930 by the work of Dr. Eddy at Columbia University, and these tests showed that coffee in the bean, packed in any open-type package, whether in tin or paper, first showed evidence of staleness on the 26th day after roasting, while ground coffee under the same conditions began to exhibit staleness on the 9th day from roasting.

All of our coffee, which is not vacuum packed, goes to the store in a double paper bag and is ground for the customers as they purchase it. The result has been that practically all of our coffee is now in the consumer's hands and used up prior to the date that the experts have determined coffee begins to exhibit staleness. For instance, coffee will be roasted in Cincinnati this morning, shipped by noon, be in Detroit warehouse tomorrow morning, and be on sale in our Detroit stores tomorrow afternoon.

Not satisfied with this effort, we found that with nearly 4,000 stores, the individual coffee mills in these stores gave almost 4,000 different grinds, and grinding of the coffee is a very important part of the procedure in finally getting the customer a good cup of coffee. So we took several outstanding store managers and sent them to the coffee mill manufacturer for a complete course in the mechanics of a coffee mill. We then started these men out to visit every single store in the company and check the condition of the mills, in each case giving them the necessary parts to take along so that each mill was placed in first-class condition and standard ground samples were furnished so that the mills could be accurately set according to each one of these standards. After having placed each mill in the company in first-class condition, we started back over the road again and are continuing the service to see that these mills are maintained in this condition.

Finally, the Kroger Food Foundation operates a home economics department, from which we distribute leaflets telling the proper method of making coffee in all the different modern coffee makers, from the old-fashioned pot for boiled coffee through to the modern glass drip coffee makers.

Now, as to whether all this effort has paid, I will discuss later when we get to the economics of the situation.

Improving and Controlling Bread Quality

Next we come to the matter of bread. While the Kroger Company has been in operation 57 years, they

Give your salesmen the advantage of factory-fresh delivery with Bemis Waterproof Bags

Because your salesmen know how close sales often come to being lost to competitors, they realize the importance of factory-fresh delivery of orders.

That's why shipment in Bemis Waterproof Bags is a valuable competitive feature for many leading makers and shippers of food products requiring special protection.

And these modern containers help in many other ways, too. Their excellent appearance of cleanliness and attractive printing create a favorable impression... their light weight lowers shipping and handling costs... their easy filling cuts packing expense... and their compactness, either filled or empty, releases valuable space.

Let Bemis Analyze Your Container Set-Up for Sales and Profit Opportunities

It will pay you to know whether your sales and profits are being handicapped by your containers. Without obligation, the Bemis Shipping Research Laboratory will study your particular needs and submit a complete report with recommendations, *if needed.* Phone or write today. Or mail coupon for the new Bemis Brochure giving valuable suggestions for better shipping.

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Please send your new brochure and details about use of Bemis Waterproof Bags for _____ (product)
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Street _____
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Mark for attention of _____

started in baking bread 38 years ago. Here again, we thought that having been in the business a long while, we knew a good deal about bread baking. But we find that the longer we stay in the field, the more we learn about this product each year. Let us start first with flour. All our flour is purchased on the specifications drawn up each crop year on the basis of the actual analysis of the new crop of wheat.

In an operation of our size, with fourteen bread and cake bakeries, it is, of course, impossible to purchase our entire flour requirements from one mill. Yet even if this might be possible, it would be an impossibility for that mill to receive a sufficient quantity of identical wheat throughout the year so that the same flour would be received in the bakeries the year around. Under the conditions of blending, it becomes necessary to determine the characteristics of each type of flour so that the final result is uniform. One of the factors which developed in the modern method of harvesting by means of the "Combine", is that in the bakeries we received flour which had a different diastatic action compared to flours previously received made from wheat harvested by the old method. I think that many of the mills now give our chemical laboratories credit for a good deal of the pioneer work which was done in endeavoring to ascertain the cause for this and the means of remedying the situation.

UNDER the old methods of harvesting, where the wheat lay in the field or in the barn for some while after cutting, before threshing, there was a certain amount of sprouting. Under the present methods, of course, the wheat is threshed as fast as it is cut and, therefore, we do not get this sprouting. Adjustments have now been made by the mills so that we get a definite diastatic action due to incorporation of some of the sprouted wheat with the other wheat in the milling operation and we are thus able to avoid entirely the use of malt in our bread.

Every carload of flour, upon arrival at a bakery, is sampled and the samples are sent to Cincinnati where they are immediately analyzed:—first, for moisture to see whether we get the quantity of flour we paid for since the government specifies an allowance of 15 per cent moisture in standard flour; second, for protein; and third, for ash. In addition to making chemical analyses of the flour, we also make numerous physical tests and then finally we bake actual small loaves of bread consisting of nothing but flour, water, and yeast, so that we judge the flour and its performance under actual service conditions. From this information, definite data is furnished each bakery so that they may know exactly what to expect in the various blends of flour which they may make from their stock on hand.

Then, over a period of time, we have run very elaborate tests on the different types of yeast manufactured. Each particular yeast manufactured seems to have characteristics peculiar to itself and, as long as we know what those characteristics are, we will be able to adjust our fermentation so as satisfactorily to use any of the yeasts on the market. We manufacture our own yeast food which, after all, consists chiefly of water conditioner, since we have a wide variety of water from Roanoke, Va. to Madison, Wis. and Memphis, Tenn. to Ft. Wayne, Indiana. We manufacture this yeast food ourselves, for the particular reason that we thus

A FEW CENTS FOR INSECT CONTROL RETURNS DOLLARS IN SAVINGS

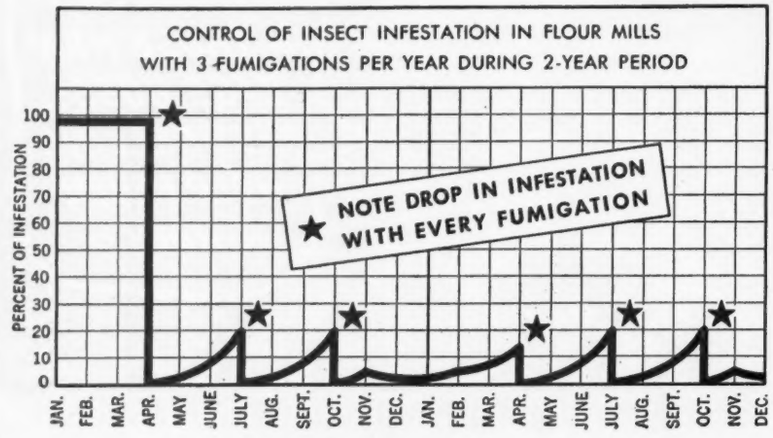


Chart shows how infestation is controlled by periodic HCN fumigation over a two-year period. Note the sharp drop in insect count at each job.

Insure a Clean Mill and a Clean Product With

LIQUID HCN

Insects multiply so rapidly that infestation in your plant is widespread before you realize it — *unless* you take effective measures of control.

LIQUID HCN stops your losses and helps you to produce a clean product. It is effective, economical, and preferred by leading mills throughout the country. It kills all stages of insect life—eggs, larvae, and adults. The cost is trifling compared to the damage uncontrolled infestation causes.

Cyanamid supplies HCN in all forms (LIQUID HCN, Commercially Pure; CALCYANIDE, *ZYKLON Discoids and *CYANOGAS). As a pioneer in the fumigation field, Cyanamid can give you specialized cooperation in cutting your infestation losses down to an absolute minimum. Write us, giving the dimensions of your mill or warehouse, and we will show you how cheaply you can obtain complete control with LIQUID HCN.

*Registered U. S. Patent Office

American Cyanamid & Chemical Corporation

Insecticide Department

30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

KANSAS CITY, MO.; AZUSA, CALIF.

have an absolute control over its uniformity and freshness at each of the bakeries, and furthermore, we can adjust our formula so as to suit our particular conditions — whether it would suit anybody else's conditions, of course, is a matter with which we are not concerned.

We manufacture our own bakery lard, going to a good deal of trouble to aerate this lard so that it creams much more easily than the standard product which we are able to buy in the open market.

Next, we manufacture our own whole milk and skim milk powder used in our bread. As you know, there has been on the market, offered to the baking trade, a powdered milk which has been termed, "with culture added". Most of the shop work on this item was done in our bakeries. While we have, of course, no means of knowing the exact chemical composition of this product, nevertheless we made a few experiments of our own and now add to our milk powder a product which, insofar as our bakeries are concerned, gives us much greater tolerance on our doughs. We are endeavoring to have all of this milk powder come from milk which passes city inspection. In other words, it would be satisfactory for fluid use in the home. Two of our three milk powder plants at the present time are on this basis and it is my estimate that 80 per cent of our product from the third plant would now pass the inspection, but we are ahead of the inspection facilities in that area.

HAVING gone to this length to maintain the quality and uniformity of the ingredients, we have made sufficient shop tests in each one of the fourteen plants so that the procedure has been standardized for each plant. To insure uniformity in mixing, we make up fondants of the other ingredients, besides the flour, water and yeast, thus also minimizing the chance of mistakes in omitting salt, sugar or any other item in a single batch.

All of our bread ovens at the present time are of the continuous type, either traveling hearth ovens or traveling tray ovens. Each week in each of our branches, a loaf of our own bread is picked up in the stores and likewise loaves of competitive bread. These are forwarded to our Food Foundation laboratories at Cincinnati where they are scored by the usual procedure standardized by the American Institute of Baking.

Our bread is distributed to the stores with as much care as we can expend in the matter and we code-date each loaf so that when the customers buy fresh bread in the stores, we may be sure that they get it. Having gone to this length to insure the quality of our raw materials and reduce the number of the ingredients to a minimum, and with proper equipment to turn out good bread, we have also given considerable attention to that most important element of all, namely; skill of personnel. In addition to shop instruction given in each plant by our general superintendent and assistant general superintendent of the bread department, we have operated several bakery schools for our bakery superintendents and foremen at the Kroger Food Foundation in Cincinnati. Also, we have paid the tuition and expenses of sending a number of our men through the bakery course of the American Institute of Baking at Chicago.

The second part of this article will appear in an early number of Food Industries.

YALE MARKED IS YALE MADE

HANDLED BY YALE HAND LIFT TRUCKS

Taking into consideration the various movings, there are over 1,000,000 lbs. of quality paper being handled every week at the Dalton, Massachusetts, plant of the Byron Weston Company, leaders in ledger paper. This is a *real* handling problem that brooks no inefficiency. The slightest laxity, and production would be slowed up all along the line—resulting in higher costs at the expense of profits. So naturally Byron Weston use the most efficient system of materials handling that they could possibly find—a fleet of Yale Blue Streaks working in conjunction with Yale Skid Platforms. These trucks and platforms are in constant service under capacity loads—yet never have they given any trouble. A typical Yale record!

And here's what the Byron Weston Company have to say about their equipment:

"On the job every day in the year, our Yale and Towne Blue Streaks have *proven* their safety and efficiency to our entire satisfaction. But above all, one thing stands out—THEIR AMAZING ECONOMY."

"But above all, one thing stands out—THEIR AMAZING ECONOMY." **That's a statement which reflects Yale service to a "T." Easier to operate—Cheaper to maintain . . . Yale Hand Lift Trucks have proven by actual on-the-job service their uncanny ability to cut handling costs to the very bone. No wonder plants which use them are so enthusiastic!**

Make the predominant choice of modern industry *your choice*. Switch to Yale—and SAVE!

Trained sales engineers are located in 56 major industrial centers ready for instant service. Consult your classified directory.

TRADE YALE MARK

THE YALE & TOWNE MFG. CO.
PHILADELPHIA DIVISION, PHILADELPHIA, PA., U. S. A.
IN CANADA: ST. CATHARINES, ONT.

Formulas

(*Continued from p.* 513)

percentages tend to produce a drink with a too intense malt flavor.

Dextro-Milk is an especially nutritious drink. It is high in energy, and the long heat treatment produces a very soft-curd that should be easy to digest. The effect of heat upon the curd tension of Dextro-Milk is shown by the data in the table.

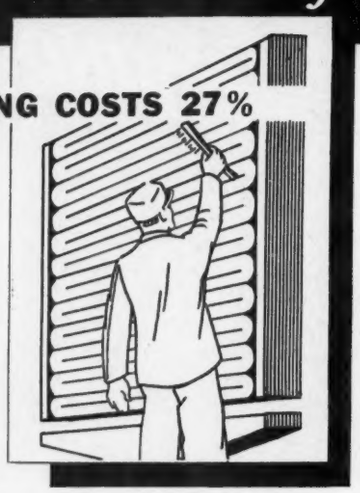
A delicious milk drink can be made by adding vanilla ice cream to the Dextro-Milk, mixing with a malt mixer and serving without any additional flavoring.

Effect of Heating and Homogenizing on Curd Tension

Sample	*Heat Treatment*	*Curd Tension Grams*
4% milk	Raw	64
4% milk	Pasteurized at 143° F., 30 min.	66
4% milk	Pasteurized; homogenized at 2,500 lb.	28
4% milk	Boiled at 270° F., 30 min.	12
4% milk	Boiled at 210° F., 60 min.	12
4% milk	Boiled at 210° F., 90 min.	10
4% milk + 11.5% dextrose.	Boiled at 210° F., 30 min.	9
4% milk + 11.5% dextrose.	Boiled at 210° F., 60 min.	8
4% milk + 11.5% dextrose.	Boiled at 210° F., 90 min.	7

Two more TOUGH Cleaning Problems MADE EASY with Oakite Cleaning

DAIRY LOWERS CLEANING COSTS 27%



Cleaning costs in a certain Eastern dairy plant were previously averaging around $90.00 per month up to a short time ago.

Now, since they have changed over to various Oakite materials for cleaning and sterilizing equipment, washing milk and cream cans, etc., not only have results been far superior, but cost of cleaning has been reduced by an average of 27% per month. We sincerely believe we can save money for you too.

EASY NOW TO CLEAN GREASY HOG TROLLEYS

A packing plant found strong alkalies unsatisfactory for cleaning hog trolleys in their spray equipment because solution did not thoroughly remove grease and other foreign matter. Now tanks are made up with the recommended Oakite material and deposits on trolleys are removed so that a good clean job results.

For cleaning hog trolleys, meat hooks, ham boilers or other packing plant equipment, the vigorous cleaning action of Oakite materials helps you to more satisfactorily meet the F. B. I. inspection requirements. Tell us your problem . . . no obligation.

Manufactured only by
OAKITE PRODUCTS, Inc., 26G Thames St., New York, N. Y
Representatives in All Principal Cities of the U. S.

OAKITE CERTIFIED CLEANING
MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

FORMULA NO. 2

Mincemeat

Lean beef, or beef trimmings, chopped fine	40 lb.
Beef Suet, chopped fine	20 "
Fresh Apples, peeled and chopped fine, variable	50 lb. to 250 "
Quinces, chopped fine	10 "
Sugar	30 "
Molasses	24 "
Apple Cider, 40 grain	5 gal.
Seeded Raisins, chopped fine	40 lb.
Dried currants	30 "
Candied Citron, cut fine	10 "
Grape Juice, or Brandy	5 gal.
Cinnamon, powdered	½ oz.
Mace, ground	¾ "
Clove, ground	1 "
Nutmeg, ground	½ "
Black Pepper, ground	¼ "
Salt, variable to suit taste, about	1-2 oz.
Yield about	220 lb. plus amount of chopped apples included.

N.B. Unless prevented by refrigeration or added chemical preservative, this mincemeat may ferment.

FORMULA NO. 3

Christmas Bouquet Fruit Cake

Ingredients	Batch Wt. 100 oz.	Batch Wt. 100 lb
Seedless Raisins	12 oz.	12 lb.
Currants	12 oz.	12 lb.
Citron Peel	6¼ oz.	6 lb. 4 oz.
Lemon Peel	3¼ oz.	3 lb. 4 oz.
Orange Peel	3¼ oz.	3 lb. 4 oz.
Grapefruit Peel	2½ oz.	2 lb. 8 oz.
Black Figs	5 oz.	5 lb.
Pitted Dates	3¾ oz.	3 lb. 12 oz.
Glace Cherries	6 oz.	6 lb.
Pecan Pieces	6½ oz.	6 lb. 8 oz.
Medium Brown Molasses	3½ oz.	3 lb. 8 oz.
Genuine Rum	3½ oz.	3 lb. 8 oz.
Light Brown Sugar	7½ oz.	7 lb. 8 oz.
Butter	7½ oz.	7 lb. 8 oz.
Eggs	8¾ oz.	8 lb. 12 oz.
Top quality special cake flour	8¾ oz.	8 lb. 12 oz.

Mixing Method

Cover the raisins and currants with scalding hot water, drain, and cool to room temperature.

Glace peels should be purchased or prepared in long, thin strips, instead

of chunky pieces, to yield an attractive, neatly sliced holiday or wedding cake. Cut figs in three or four slices. Dates, cherries and pecans may be left uncut. Mix all with raisins and currants.

Blend the molasses and rum. Then add to fruit. Mix evenly. Cover and let stand 24 hours.

Cream the brown sugar and butter on low speed until light (8 to 10 minutes). Then work the eggs in gradually with the mixer operating on low speed. Then set the machine on second speed and beat from 2 to 4 minutes.

Shift back to low speed, add the flour and mix for 2 to 3 minutes. Next add the prepared fruit, mixing carefully to secure even distribution.

Have butter and eggs in perfect condition, as for pound cake. Have pans dry and free from rust. Use paper liners, if possible, removing them before the cakes are wrapped in cellophane.

Bake 2 to 2½ hours for large form cakes or bars. Oven temperatures will vary from 275 in a small oven to possibly 325 deg. F. in a large loaded oven. Pans should be covered during a part of the time if cakes start to dry or become crusty.

Formula reprinted from "Bakers' Cake Better Than the Housewife can Bake," by permission of the Brown's Hungarian Corporation.

FORMULA NO. 4

Liquid Seasoning for New England Style Baked Beans

Fruit Fine Sugar	6 lb.
Fine Salt	20 "
Ground White Pepper	2½ "
Powdered Ginger (Best Grade)	1¼ "
Yellow Mustard Flour (Best Grade)	2½ "
Onion Powder (Calveg)	3 "
Sodium Alginate	8 oz.
Sodium Bicarbonate	1 lb.

Mix dry and add to 50 lb. best grade molasses. Heat to 212 deg. F. Shut off heat. Add additional 50 lb. best grade molasses. Stir thoroughly. Bottle hot.

A 4-oz. bottle is a suitable package for use with 1 lb. of dry beans with 8 oz. of salt pork.

Formula by Parker-Broeg, Boston, Mass.

FORMULA NO. 5

Prepared Pork and Bean Seasoning, New England Style (Concentrated)

"Fruit Fine" Sugar	6 lb.
Fine Salt	20 "
Ground White Pepper	2½ "
Powdered Ginger (best grade)	1¼ lb.
Powdered Yellow Mustard	2½ "
Onion Powder (Calveg)	3 "
Acid-free Cornstarch	7 "
Sodium Bicarbonate	1 "

Mix dry. The product is hygroscopic and will cake if it becomes moist. Package in moisture proof envelopes, containing directions for household use. Insert 1 or 1½ oz. per envelope. Partial consumer directions: 1 or 1½ oz. of concentrated flavoring to each lb. of dry beans, plus 2 to 4 oz. brown sugar (or best grade of molasses), plus 8 oz. salt pork per lb. of dry beans. Household recipe will comfortably fill 3 to 3½ pint bean pot. Additional details on household recipe available on request.

MODIFICATIONS — For complete seasoning, add to the foregoing batch 75 lb. of No. 8 or No. 9 soft sugar (brown). Package 3 or 4 oz. of product for use with each lb. of dry beans.

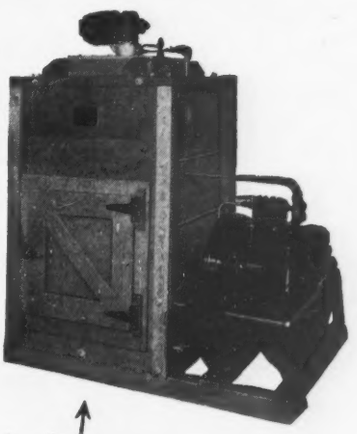
Formula by Parker-Broeg, Boston, Mass.

Now you've PAID your Summer Ice Bill!

How much would you have Saved with . . . VILTER PAKICE at $1.25* PER TON?

VILTER PAKICERS . . . producing BETTER ICE for as low as $1.25* per ton have paid for themselves over and over again in Food Plants all over the country. Every day, they're cutting Ice Costs down to the bone—averaging from 50% to 75% reductions in many plants. That's a Saving worth considering.

And Vilter PakIce IS better! It handles easier, lasts longer, offers more certain protection to delicate foods,—is softer, without the sharp points and damaging lumps of crushed ice. It's the ideal Icing for all food refrigeration.



★ We'll be glad to tell you in DOLLARS AND CENTS just what PakIce will save in Your Plant . . . . and at no obligation to you. Just return the Coupon.

*Average Cost—Depends upon local Power Rates.

VILTER . . .

½-ton Self-contained PakIcer.

PakIce Units are built for every size plant, from ½-ton, 1-ton, 2½-tons, 5-tons, and up to 30-tons capacity in 5-ton increments.

Superior Since 1867 VILTER Refrigeration... Air Conditioning

The VILTER MFG. CO.
2115 S. First Street
Milwaukee, Wisconsin

THE VILTER MFG. CO.
2115 S. First Street, Milwaukee, Wisconsin

Send us more details of SAVINGS with Vilter PakIcers, to fit the following conditions:

Amount of Ice used: Maximum Daily.....
Annually ..... No. Months .....
Water: Temperature ..... Cost .....
Power: Volts ..... Ph. ..... Cycle .....
Cost per K.W.H. .....
Present cost of Ice per ton .....
Name .....
Address .....
City ..... State .....

added and after being well stirred the cream is allowed to rest two to eight minutes. Heat is then applied both from the steam jacket and the coil, to bring the cream in two minutes to 194 deg. F. After three more minutes the jacket and coil are cooled with tap water, then with ice water or a refrigerating liquid, to chill the cream to 34 to 39 deg. F. for packing in sterile cans.

In a modification of this procedure, the cream is first centrifuged and the larger fat globules thus separated are made into butter, only the fraction with small fat globules being treated as described.

Carotene Deficiency and Oxidized Milk Flavor

IN THE COURSE of an investigation of oxidized flavor in milk, it was discovered that four cows were excreting in their feces more carotene than they were consuming. The flavor of the milk from each of these cows was markedly and quickly improved by adding a carotene concentrate to the ration. (Carotene makes vitamin A —Ed.)

Low carotene intake was associated regularly with milk which developed oxidized flavor, while high carotene intake prevented or remedied it. But the relation to moderate intakes was irregular. Possibly the level of carotene intake is not the only factor involved in oxidized flavor.

Digest from "Carotene Balance and Blood Carotene Levels in Heifers and Lactating Dairy Cows And Their Relation to Off-Flavor Milk," by Whitnah, Peterson, Atkeson, and Cave (Kansas Ag. Exp. Sta.). *Journal of Agricultural Research*, **58**, 343, 1939.

Churning Cold Storage Cream

CREAM which has been kept in cold storage can be successfully churned if it contains at least 40 per cent butterfat and has been stored at temperatures below 23 deg. F., preferably below 14 deg. F. The invention is disclosed in German Patent 672,524 (granted March 3, 1939, to N. V. Linthorst, Koelhuis en Ljsfabrieken, Deventer, The Netherlands) and is also covered by Belgian Patent 429,407 (granted Jan. 26, 1939). The preferred cream product contains 50 to 55 per cent butterfat. Canned cream which has been kept several months at 14 to 18 deg. F. is suitable for the purpose.

Preventing Gassy Limburger Cheese

NEWLY MADE LIMBURGER, especially in summer, is often gassy, so many holes develop that the cut cheese has the texture of a sponge. This is due to bacteria of the coli-aerogenes group. Relatively few of them in the milk will cause the trouble. Gassiness can be prevented by heating the milk to 145 deg. F. and holding for at least fifteen minutes, or heating to 163 deg. F. flash, then cooling to setting temperature. Holding milk for fifteen seconds at 160 and 162 deg. F. did not give as good cheese as that made from raw milk.

Digest from "Studies on the Control of Gas In Limburger Cheese," by C. D. Kelly, *Journal of Dairy Science*, **22**, 299, 1939.

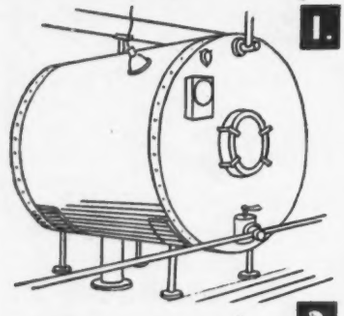
FISH

Codfish Flour In Baking

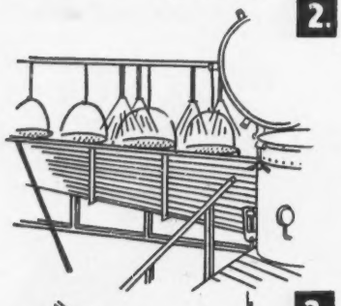
ALBUMEN prepared from animal muscle fiber, e.g., from fresh codfish flesh, is a useful ingredient in baked products such as butter biscuits

USE HTH PRODUCTS*

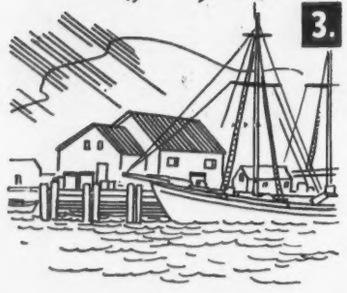
To Cut Spoilage Loss, Guard Quality



1. Keeping milk storage tanks, tank trucks, tank cars, etc. sweet and germ-free is a job for which dependable chlorine sterilizers like HTH Products are ideally suited. No danger of expansion strains, no breakage (of glass-lined tanks), no loss of time in allowing equipment to cool—as when steam sterilization is used.



2. In canneries, the tiniest imperfection in cans may result in contamination of the product by the water in cooling equipment. Cooling water should therefore be kept safe by maintaining a constant residual of available chlorine in the water. HTH Products contain available chlorine in convenient form ranging in concentration from 15% to 70%.



3. Sanitation problems in the fish industry fall naturally into three divisions—(1) purification of plant water supplies, (2) disinfecting and deodorizing containers and equipment, and general plant sanitation, and (3) disinfecting and deodorizing wharves and the decks and holds of fishing vessels. For all these uses, HTH Products offer a convenient means of effective sanitation.

Dairies, canneries—any and all plants that deal with perishable products—face the same hazard of heavy financial loss due to bacterial contamination.

It doesn't pay to gamble with germs—especially when you can combat spoilage by this simple, economical, thoroughly effective means.

Use HTH Products. These famous chlorine sterilizers come to you in convenient powder form. Added to water, HTH Products make fast-killing hypochlorite solutions that keep their strength and are *dependable* in germicidal action. So economical, you can use freely to flush, spray or wipe all surfaces that come in contact with food or beverage products.

Send today for full information about HTH Products and their use.

HTH PRODUCTS

THE MATHIESON ALKALI WORKS (INC.) 60 EAST 42ND STREET, NEW YORK, N. Y.

* HTH PRODUCTS (HTH, HTH-15 and LO-BAX) . . . DRY ICE . . . CARBONIC GAS . . . AMMONIA, ANHYDROUS and AQUA . . . CAUSTIC SODA . . . SODA ASH . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . PH-PLUS (FUSED ALKALI)

meringues, sponge cake and the like. As the invention is disclosed in British Patent 501,630 (granted May 25, 1939, to P. P. Hiltner, of Hamburg, Germany) muscle from codfish or other animal source is comminuted, suspended in water acidified to pH-4 with citric acid, heated and stirred about an hour at 149 deg. F., then centrifuged. This frees the substance from most of the water, fat, mineral matter and substances which impart color, odor or taste. This product is freed from residual fat by extraction with alcohol, and rendered water-soluble by short heating at 194 deg. F.

For use in baking, the treated animal protein material may be added as dry powder to the flour, or it may be beaten in water to a froth, or it may be emulsified with starch, eggs or fats.

New Kind of Food Poisoning

AN UNUSUAL TYPE of bacterium, of the *actinomyces* type, was apparently the cause of a food poisoning case in South Carolina. This organism was isolated from a can of fish roe which was heavily contaminated with it. This type of bacterium is not commonly the cause of food poisoning, but cultures from it affected rabbits and cats.

Digest from "An Actinomyces-like Organism Associated with a Food-Poisoning Outbreak," by Ben D. Chinn, *Food Research*, 4, 239, 1939.

MEAT AND POULTRY

Water Cooling of Poultry

IN PREPARING POULTRY for marketing, it is bled, plucked and precooled to near 32 deg. F. before grading and packing for shipping or storage. Immersing the birds in water at 32 deg. F. for two hours prior to air cooling cut the cooling time 60 per cent over air alone. Cooling in water at 45 deg. F. did not help and the water showed bacterial growth which did not occur in the 32 deg. water. Air cooling alone causes a loss in weight averaging below ½ of 1 per cent, while water cooling increases weight slightly but very variably. Retention of bloom was unaffected by the water cooling.

Digest from "Precooling of Poultry," by W. H. Cook, *Food Research*, 4, 245, 1939.

Gelatine With Increased Whipping Quality

CONVERSION of free amino to alcohol groups in gelatine molecule to improve its whipping quality for marshmallow making constitutes the discovery covered in U.S. Patent No. 2,158,117.

When done by treating an acid gelatine liquor with sodium nitrite or an alkaline cured gelatine with nitrous acid, or with an acid and sodium nitrite, the increase in whipping quality is claimed to be obtained without adverse effect upon the viscosity or jelly strength of the gelatine.

The slight darkening in the color of the treated gelatine may be overcome by bleaching with sulphurous acid or a hyposulphite.

The patent has been assigned to Industrial Patents Corp., Chicago, Ill., by Donald P. Grettie, the patentee.

MILLING & BAKING

Putting Vitamin C into Flour

ENRICHMENT OF FLOUR with vitamin C, to impart an added food value to baked products, is effected by adding specially prepared stable powder mixtures. As disclosed in British Patent 503,476 (granted June 30, 1939, to

★ Cercon is an edible, tasteless wax suitable for coating food products requiring protection from the air.

It is supplied in six colors—Snowdrift, Lemon, Orange, Tangerine, Apricot, and Olive. It has an ASTM penetration of 50 with the 50 gram weight attached.

We will be very glad to send test samples to any interested company.

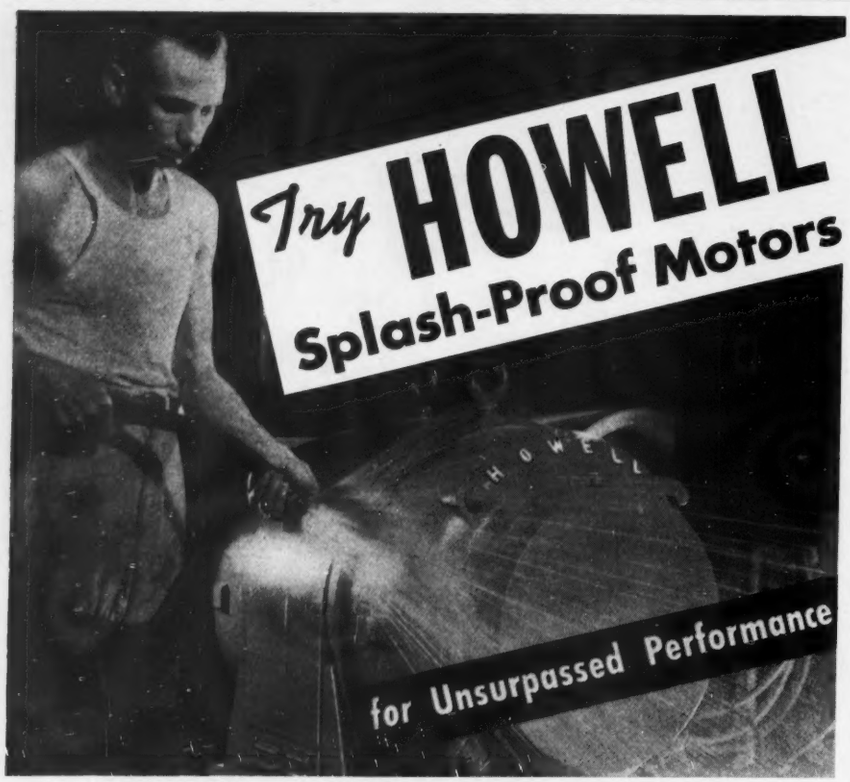
THE CONEWANGO REFINING CO.
WARREN, PENNSYLVANIA

Naamlooze Vennootschap Industrieele Maatschappij voorheen Noury en van der Lande, Deventer, Holland), the invention comprises incorporating ascorbic acid or a related vitamin C compound, such as sodium ascorbate or isoascorbate, with an inorganic powder such as di- or tricalcium phosphate, gypsum, silica, talc, magnesium carbonate or potassium sulphate, or with an organic powder such as starch from wheat, rice, maize or potatoes. Then the product is mixed in suitable proportion with the flour to be enriched.

High Temperature Conditioning Wheat

IN CONDITIONING WHEAT, the grain is not necessarily damaged and may even be benefited by very high temperatures, provided the other conditions are adjusted accordingly. A process (which is not now recommended, but which is effective) exposes wheat for a short time to a temperature of 788 (correct) deg. F. In this case, the grains are first wetted so that a blanket of steam protects the heat from penetrating into the wheat grains. In another process, it has been found that air-dried wheat (13–18 per cent moisture) can withstand a temperature of 215 deg. F. for three minutes without the slightest deterioration in gluten quality. In fact, baking tests after the treatment even showed improved gluten behavior. The important point is to adjust time and temperature accurately, according to moisture content, to give the desired result without damage to the grain. Of course, a suitable time-temperature balance must be maintained, compensating high temperatures by shortening the exposure time, if heat conditioning is to give beneficial results.

Digest from "Conditioning Wheat," by Hugo Kühl, *Chemiker-Zeitung* **63**, 469, 1939 (Published in Germany).



You can SAFELY use HOWELL Splash-proofs for any drive service inside your plant or out-of-doors. Moisture can't faze them!

Our special design and construction prevent splashing or dripping liquids from reaching and injuring motor windings.

Try HOWELL Splash-proofs and cut your drive costs to rock bottom! They are slightly higher priced than open motors, but well worth the few dollars additional. FAST deliveries on all sizes. Write for Bulletin 1123C.

VIBRATION TEST GIVEN EVERY MOTOR

No accident that HOWELL Motors make good on hard jobs! This Vibration Test checks both bearings and rotor, making certain of perfect balance. And, before shipment, every HOWELL Motor must pass three other final tests of equally exacting nature.

HOWELL BIG BAND MOTORS Make Good on Hard Jobs

HOWELL ELECTRIC MOTORS COMPANY
HOWELL, MICHIGAN
Representatives In All Principal Cities

RAW PRODUCE

Proper Storage Temperatures for Vegetables

COOLING VEGETABLES from 90 to 55 deg. F. helps the keeping qualities relatively little. Precooling below 55 deg. F., which seems to be a critical temperature, is decidedly beneficial. Less perishable vegetables, such as brussels sprouts and celery, have their life increased more greatly by low temperatures than do easily perishable vegetables. When packed in commercial containers it may take as long as 60 hours for vegetables to fall to storage temperature. They may in fact remain 10 or 15 deg. above it owing to respiration. On the other hand, they wilt less when packed in baskets than when spread out. Appearance and wilting alone are not always the true test for loss of quality. For such vegetables as sweet corn, asparagus and peas, the loss of sugar is a better criterion of their loss of eating quality. Properly precooled to 35 deg. F., a shipment of peas from the west coast to New York City, taking ten days in transit, will reach the market in better condition than peas trucked from upstate New York in 30 hours.

Digest from "Effect of Temperature on the Rate of Deterioration of Fresh Vegetables," by Hans Platenius, *Journal of Agricultural Research*, **59**, 41, 1939.

MISCELLANEOUS

Spices as Preservatives?

CONTRARY to popular belief, spices are not good preservatives against bacteria. Commercial whole and ground spices vary in bacteria count from

zero (in samples marked "sterile") to 67,000,000 per gram. Spice oils, 50 per cent oil emulsions and spices in a sugar-soluble base were sterile. Ground cinnamon and cloves alone show bacteria inhibiting action in low concentration. For this effect to be appreciable, ground peppercorn and allspice must form 1 per cent and mustard, mace, nutmeg and ginger 5 per cent of the medium. Their action on different bacteria varies. Unsterilized spices added to processed dill pickles caused slippery and soft pickles; added to spiced peaches and pears, soft and mushy fruit was the result.

Digest from "The Role of Spices in Pickled-Food Spoilage," by F. W. Fabian, Catherine F. Krebl and N. W. Little, *Food Research*, 4, 269, 1939.

Rust Remover

THE FOLLOWING FORMULA for removing rust from metals is supplied by the Glycerine Producers Association. "The product is a paste, particularly suited for use in inaccessible engraved surfaces".

Oxalic Acid	20 parts
Phosphoric Acid	20 parts
Glycerine	10 parts
Ground Silica	50 parts

Apply the paste to the rusted area. After standing in a warm place from 15 to 20 minutes, then wash off.

More Than A Number

(*Continued from page* 499)

the name of the operator.

6. An Ohio machinery maker marks the stalls in the parking lot not by number, but by name. (One of the guards at the gate prepares the stencils on a small stencil-cutting machine.

7. The lockers in the dressing room of an Ohio food plant bear the names of the employees using them.

8. An Indiana chain of service stations provides the attendants, managers, and "grease monkeys" with appropriate uniforms, each bearing the man's name across the back.

9. Many companies make special efforts to post conspicuously on their bulletin boards the names of individuals participating in company activities—suggestion awards, interdepartmental team results, team standings, high scorers, substitutes, etc. (Your employee publication can further carry out the same idea.)

These are just a few of the methods used to give the individual some opportunity to offset the loss of identity he experiences in the shop. There are many other ways. For example: safety plaques bearing the safe worker's name are displayed by bakery routemen, bus drivers and other service employees.

Several large companies have recently held what they called "open house," or "visitor's night." Every employee was urged to bring his wife, sweetheart, mother or friends down to the shop to see just what went on. This idea enabled the workman to exhibit at least the machine that "brings home the bacon," even if he can't place his name on each article his machine produces.

Employers are overcoming "employee repression" by one means or another. There is room for a certain amount of this in most every plant. Maybe the ideas suggested above will not fit your plant. Nevertheless, some honest thinking would likely yield a plan which would work with your people.

The effects of such plans are very desirable as far as giving the man some way in which he can swell out his chest with considerable pride and say "See? 'Harry Bowers.' That's me."

BOOKS RECEIVED

PLANT CHEMICULTURE. By C. D. Dawson and M. V. Dorn, Third Edition. Published by the authors, 4613 West Washington Blvd., Los Angeles, Calif. 1939. 130 pages; 5⅛x8¼ in.; paper. Price, $1.

Presented as a guide to experiments in growing plants without soil, this revised and enlarged third edition is a practical tool for those who wish to delve into the possibilities of this new system of food production. In addition to general information about the background and possibilities of chemiculture, the book tells the functions of the nutrients, gives formulas for the solutions, describes the equipment and methods and gives sources of supplies.

CONTAINERS FOR FRUITS AND VEGETABLES. Farmers' Bulletin No. 1821. By L. C. Carey. Published by U. S. Department of Agriculture, Washington, D. C. 1939. 63 pages; 6x9¼ in.; paper. Price, 10 cents; for sale by Superintendent of Documents, Washington, D. C.

Shippers and processors of fresh fruits and vegetables will find the specifications and illustrations for standard and commonly used containers of practical value. The use of too many types and sizes of fruit and vegetable containers imposes an unnecessary burden on the trade.

CONSUMERS MARKET DATA HANDBOOK. 1939 edition. By Ben P. Haynes and Guerry R. Smith. Published by U. S. Department of Commerce. 464 pages; 9½x11¾ in.; cloth. Price, $1.75; for sale by Superintendent of Documents, Washington, D. C.

Here is a collection of market statistics that will be useful to sales promotion and advertising executives. The handbook presents in convenient form general consumer market statistics on small geographic areas. In general, the figures presented indicate where consumers live, how many there are, the type of community in which they live, the kinds of stores they patronize and their ability to buy. This data is given by counties and cities, and it includes 82 carefully selected items.

CANNED FOOD REFERENCE MANUAL. Published by American Can Co., 230 Park Ave., New York, N. Y. 1939. 242 pages; 5⅝x8 in.; cloth. Free to professional people.

Here is presented a bird'seye view of the canning industry, including its history, technology, products, containers and regulations. Extensive data are given in tables on the composition of some commercially canned foods. There are also statistics on pH ranges, on case capacities for common can sizes, on canned food production and on the inorganic components of common foods. One chapter is devoted to the text of the Federal Food, Drug and Cosmetic Act. A five-page bibliography gives the book added value.

MICROBIOLOGY IN THE PRESERVATION OF THE HEN'S EGG. Food Investigation Special Report No. 47. By R. B. Haines. Published by His Majesty's Stationery Office, London, 1939. 65 pages; 6x9¾ in.; paper. Price, $0.75; obtainable through The British Library of Information, 50 Rockefeller Plaza, New York, N. Y.

Nearly half of this report is devoted to spoilage of eggs during storage,

causes of spoilage and means of preventing it being discussed. Four plates in color illustrate green rot, red rot and two types of black rot. The microbiology of the egg during oviposition and after laying is also covered.

RESPIRATORY ENZYMES. By University of Wisconsin Biochemists. Published by Burgess Publishing Co., Minneapolis, Minn. 1939. 236 pages (multigraphed), 8½x10¾ in.; imitation leather. Price, $3.25.

Workers engaged in enzyme research at the University of Wisconsin during the past year presented rather extensive surveys on assigned divisions of enzyme practice and theory. And this book is a compilation of that material.

It covers dehydrogenases; oxidases; coenzymes; carriers; flavoproteins, ascorbic acid, glutathione and adrenochrome; inhibition of dehydrogenases and related systems; hydrogen transport systems; oxidation-reduction potentials and their applications; and physical-chemical theory of enzyme reactions.

PROTECTIVE COATINGS FOR METALS. By R. M. Burns and A. E. Schuh. Published by Reinhold Publishing Corp., 330 West 42d St., New York, N. Y., 1939. 407 pages 6½x9¼ in.; cloth. Price $6.50.

Prepared as one of the American Chemical Society Monograph Series, this work is of a scientific nature, yet it has considerable information of use to the food engineer.

Among the sixteen chapters are some of special interest in the food field, including: Types of Metallic Coatings and Methods of Application; Tin Coatings; Nickel and Chromium Coatings; Methods of Testing Metallic Coatings; The Durability and Evaluation of Paints; and Paint Practices.

DURUM WHEATS AND THEIR UTILIZATION. By Carl L. Alsberg, Food Research Institute, Stanford University, Palo Alto, Calif. Published by the Food Research Institute. 28 pages; 8½x11 in. Price, $0.75.

Dr. Alsberg has produced here another of his long series of well-known wheat studies. In his usual scholarly and complete manner, he reviews the world's published (and some unpublished) knowledge of durum wheats and how they are utilizable for baking as well as for the better known uses for macaroni products.

It is full of suggestive ideas, and should be read by all durum wheat millers as well as all macaroni manufacturers.

PESTS OF GRAIN. Published by Department of Scientific and Industrial Research (England). 18 pages. Price, 10 cents. Available from British Library of Information, 50 Rockefeller Plaza, New York, N. Y.

This leaflet briefly states the facts about the most common pests of grain and other products and the ways in which they may be combatted by simple hygienic measures.

PATENTS

Confection Shells Formed and Subsequently Closed by Mechanical Means—Henry E. Bianchi, Rutherford, N. J. to G. Cella, Inc., Nos. 2,163,579 and 2,163,580. June 27, 1939.

Pectin Precipitated From an Extract Solution by the Addition of a Copper Salt Preparatory to Drying—Philip Bliss Myers, Scarsdale, N. Y., to Sardik, Inc., Jersey City, N. J. No. 2,163,620. June 27, 1939.

Pectin In Solutions Treated With a Nickel Salt at a pH of Approximately 3.5 to 4.5 to Form a Water Insoluble Precipitate—Philip Bliss Myers, Scarsdale, N. Y., to Sardik, Inc., Jersey City, N. J. No. 2,163,621. June 27, 1939.

Grain Tempered to Desired Uniform Moisture Content by Steam Treatment Under Vacuum—Orrin H. Pilkey to the Guardite Corp., Chicago, Ill. No. 2,163,628. June 27, 1939.

Cheese Homogenized at Pasteurizing Temperatures With the Addition of a Soluble Complex Sodium-Alkaline-Earth-Phosphate—Fritz Draisbach, Ludwigshafen-on-the-Rhine, Germany. No. 2,163,778. June 27, 1939.

Composite Mixture of Crystalline Dextrose and Starch Solidified to Stable Mass by Seeding Sugar Liquor With Water-Containing Starch Material and Cooling—Walter R. Fetzer, Clayton, Mo., to Union Starch & Refining Co., Columbus, Ind. No. 2,163,782. June 27, 1939.

Cucumber Pickles of Regular and Irregular Shapes Cut Into Equal Slice Thicknesses by Mechanical Means—Charles G. Lang, to C. C. Lang & Sons, Inc., Baltimore, Md. No. 2,163,791. June 27, 1939.

Oleo Oil Stabilized by Alkali Refining and Incorporation of a Quantity of Hydrogenated Refined Soya Oil—Harold S. Mitchell to Industrial Patents Corp., Chicago, Ill. No. 2,163,912. June 27, 1939.

Icings Containing Fat Made With Destarched Corn Gluten and Sugar as Ingredients—Theodore John Otterbacher, Zion, Ill. to Corn Products Refining Co., New York, N. Y. No. 2,163,913. June 27, 1939.

Mechanical Washer for Sliced Potatoes Equipped With Means For Grinding and Discharging Settled Solids—Joseph D. Ferry, Harrisburg, Pa. No. 2,163,977. June 27, 1939.

Sugar Beet Juice Continuously Defecated and Carbonated Preparatory to the Manufacture of Sugar—Robert J. Brown and Alpheus R. Nees, Denver and Claude T. Carney, Greeley, Colo., to Great Western Sugar Co., Denver, Colo. No. 2,164,186. June 27, 1939.

Disaccharides Inverted by Autolyzed Yeast Preparatory to Fermentation with B. tetryl—William Ludwell Owen, Baton Rouge, La. No. 2,164,255. June 27, 1939.

Foaming Temperature of Milk Raised to Approximately 40 Deg. F. Through Homogenization and Addition of 1 to 5 Per Cent Milk Powder—Herbert Stanley Samson, Winnipeg, Man., two-fifths to John A. Dienner, Evanston, Ill. No. 2,164,351. July 4, 1939.

Fruit Quick-Frozen With Formation of Only Small Crystals in Invert Sugar Bath Held at Temperature of 0. to 10 Deg. F.—Robert B. Taylor, Knoxville, Tenn. No. 2,164,362. July 4, 1939.

Tomatoes Peeled by Mechanical Means in an Intermittently Rotating Drum—Vincenzo Carpentieri, Turin, Italy. No. 2,164,384. July 4, 1939.

Ingredients of a Dry Mix Accurately Blended by Mechanical Means—John A. Owens, Des Moines, Iowa. No. 2,164,542. July 4, 1939.

Invertase Preparation From Yeast Extractions Made to Contain 50 Per Cent Glycerine Concentration—Herbert C. Gore, Scarsdale, George Kirby, Yonkers, and Charles N. Frey, Scarsdale, to Standard Brands, Inc., New York, N. Y. No. 2,164,914. July 4, 1939.

Invertase Preparation From Yeast Extraction Adjusted in Acidity by Addition of an Antacid and Treated With Heavy Metal Preparatory to Addition of Glycerine to Give 50 Per Cent Concentration in Final Product—Glennard E. Miller, New York and Robert F. Light, Mt. Vernon, N. Y., to Standard Brands, Inc., New York, N. Y. No. 2,164,936. July 4, 1939.

Drained Cheese Curd Formed Into Cylindrical Blocks Suitable For Cutting Into Wheels—Thorkild Petersen, Elgin, Ill., to Pure Milk Cheese Co. No. 2,165,005. July 4, 1939.

Baking Pans Greased With Product Containing a Low Melting Pan Oil and a Film-Setting Component—Iva de Freese Savage, Jersey City, N. J. No. 2,165,154. July 4, 1939.

Biscuit Doughs Molded on Rotary Machines—George Ralph Baker and George Donald Wilson, Peterborough, England. No. 2,165,528. July 11, 1939.

Berry Solids and Juices Freed From Seeds, Stems and the Like by Passing Through Centrifuge—Samuel Levison, Chicago, Ill. No. 2,165,557. July 11, 1939.

Sausages Linked by Mechanical Means—Ernest A. Mummé, Minneapolis, Minn. No. 2,165,673. July 11, 1939.

Noodle-Making Machine—Henry Chan Mun, San Francisco, Calif. No. 2,165,718. July 11, 1939.

Fresh Animal Blood Coagulated and Cut Into Relatively Small Uniform-Sized Pieces and Subsequently Heat Treated to 212 Deg. F.—James L. Norman, Oakland, Calif. Nos. 2,165,721 and 2,165,722. July 11, 1939.

Flavoring Material Stabilized Against Deterioration or Loss of Flavoring Properties by Emulsifying With Proteolytic Enzyme Hydrolyzed Flour—Hugh E. Allen, Evanston, Ill., one-half to Albert G. McCaleb, Evanston, Ill. No. 2,165,828. July 11, 1939.

Starch Paste Made to Have Water-Free and Water-Resistant Properties—Harold E. Bode, Chicago, Ill., to Corn Products Refining Co., New York, N. Y. No. 2,165,834. July 11, 1939.

Pectin-Containing Raw Material Leached by Copper Salt Solution With Formation of Insoluble Copper Pectinate—Philip Bliss Myers, Scarsdale, N. Y., to Sardik, Inc., Jersey City, N. J. No. 2,165,902. July 11, 1939.

Dried Egg White Made to Contain Small Amounts of Tartaric Acid and Aluminum Hydroxide—Verne D. Littlefield, Beverly Hills, Calif., to Armour & Co., Chicago, Ill. No. 2,166,070. July 11, 1939.